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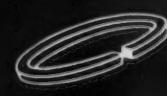
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Member, Audit Bureau of Circulations
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Indexed in the Industrial Arts Index.
Published every Thursday. Subscription
Price: United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 a year.
Single copy, 25 cents.
Cable Address, "Ironage, N. Y."

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THE IRON AGE

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... THE IRON AGE ...

ESTABLISHED 1855

MARCH 24, 1938

Vol. 141, No. 12

A United Front for America . . .

By JOHN H. VAN DEVENTER

Editor, The Iron Age

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THE accompanying article is based upon an address made by Mr. Van Deventer before the Rochester, N. Y., Industrial Management Council on March 21 and also before the Eastern New York Association of Purchasing Agents on March 24.

It deals with the steps which the author believes management must take to counteract the "slow down" which is spreading in American industry and to deal with its basic psychological cause which is fear of displacement through technological improvement.

• • •

I AM borrowing an expression—a united front—from our left wing brethren, who are such apt phrase makers. I do not know of anything that we need more in America today than a united front. But not the kind which is being imported from Europe.

Over there, the united front is for political action. We have not had such a thing here as yet unless you can call the 46-state-Roosevelt landslide of 1936 by that name. That, it is true, was an expression of mass dissatisfaction and the expression of a hope to see ourselves legislated back to a state of prosperity. How futile it is to expect to secure this by political action we have since learned by unfortunate experience.

The united front that I am going to talk to you about tonight is a different kind of one. There is no politics in it. It is a united front, by employers, workers, investors and consumers on a common ground and for

a common purpose. The purpose of making business better and then of keeping it good.

When, in January of this year, I launched this thought in embryo before the S.A.E. of Dayton, Ohio,* I said that employers and employees especially would do well to throw aside their non-essential differences and to unite on a common ground for this mutually beneficial purpose of making business good. To illustrate what might be done by calling attention to what had not been done, I propounded two series of questions: one addressed to labor and the other to employers of labor.

Of labor, and particularly organized labor which is articulate and influential, I asked why had it not expressed itself regarding the corporate surplus tax act, since that act was held, in the opinion of so many, to be an outstanding deterrent to business and employment.

That question was promptly an-

*See THE IRON AGE, Jan. 27, page 22.

swered by the American Federation of Labor, which, as you know, on February 11 went on record for the repeal of the act. So labor has already taken the first step toward the united front on the common ground.

To employers I also put this question: What have you done to point to the practical solution of the unemployment problem or to throw light upon the problem of technological displacement.

That question, of course, could not be so promptly answered, but answered it must be if we hope to retain either the basic framework of a democracy or the fundamental economic belief in the virtue of effort and efficiency.

Tonight I want to pursue this question with you further, for to my mind it is the most important one that the management of industry has before it. It's far more important than the question of how to make a profit. And if it is not answered, there will be no profits.

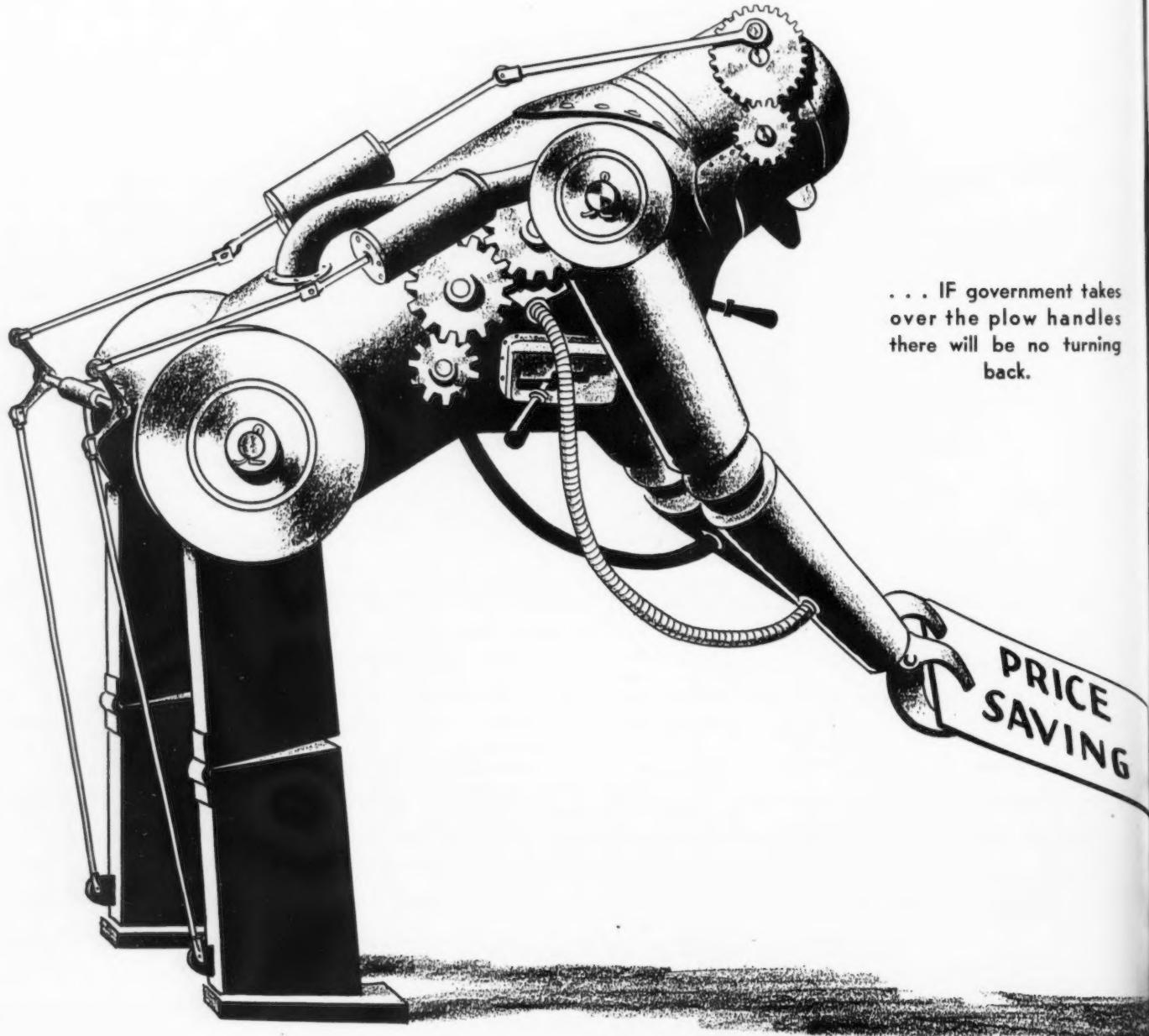
The American Slow Down

Ever since the beginning of our machine age, American industry has progressed by following the basic formula of prosperity through efficiency gains—more power, better machinery, greater output per man hour, higher wages, lower prices. Every successful concern which has catered to broad public demand has conscious-

ly or unconsciously followed that formula. Its application, broader in America than in any other land, has been responsible for placing us in an enviable position among the family of nations.

This formula is now being sabotaged. Sabotaged by a number of forces which are working in unison, but not in combination. As yet, this movement has not attained a united front.

Part of it is due to the New Deal's hesitant hovering between a philosophy of scarcity and a philosophy of plenty. Part of it is due to the communist's program to wreck capitalism. Part of it is due to the growth of power of our labor unions with their



traditional policy of output restriction. Part of it, and quite a large part, too, is due to the mistakes and short-sightedness of management.

By far the larger part, however, is due to the worker depression psychology engendered by the thought of the ten million unemployed and the fear of joining their ranks.

A depression psychology? The worker is entitled to his bogeyman as well as is his employer.

The employer's nightmare pictures a President who is out to do away with profits. The worker's nightmare pictures a machine that is out to deprive him of a job.

Silly? Probably so in both cases. But remember, the important thing is not whether or not such beliefs are founded on fact or fancy. The important thing is that they exist.

That this fear of the machine exists in the minds of many of our workers is evidenced by the "slow down" of improved machines that is occurring in a number of localities in this country. It does not apply to old machines so much as to new ones.

Here is how it works. An inventor or tool designer devises some improvement to an existing machine that will increase its productivity say 25 per cent over those now in use. The machinery builder sells this machine to a customer on the basis of its investment value as a cost-saving device. When it is installed, it produces exactly as many units per day as the old machine and no more. A demonstrator is sent from the machinery builder's factory to show that the guarantee of the maker can be met.

He meets it easily. But when he leaves the user's plant, down goes production again to the old level. Even the inducement of an extra reward to the operator in the form of piecework rate or bonus has no effect.

So far as this particular case is concerned, there has been a complete sabotage of the efficiency formula. There has been a complete sabotage of the inducement to the inventor to invent, of the improver to improve or of the user to invest in better equipment. Of course, it is also sabotage of the worker's hope for a higher standard of living, but he does not know it.

This sabotage is not necessarily attributable to trade union policy. It exists in plants where there are no trade unions. If it spreads far enough—and it is spreading—it will freeze us into a status quo so far as economic progress is concerned. And when you stop going forward in this dynamic world you are beginning to move backward.

Obsolescence? So What!

Of what use will our exhaustive studies of machine obsolescence be if the prospective machine buyer, faced with this deadlock, finds it no more profitable to use his new machines than his old ones?

And under such circumstances, what will happen to our inventors and machinery builders? And in turn, what will happen to the consumer, who has been led, by generations of experience, to expect continually more for his money?

It can't happen here. But it is happening. Perhaps it hasn't yet crossed your doorstep, but it will, unless management and employers wake up and do what they should have started to do long ago.

Even where management has gone to the extreme of guaranteeing its workers an annual income, as in the case of the George A. Hormel Co., which has recently been well publicized, the fear of the machine seems to remain. For I note that the workers of that company, even under this beneficent arrangement, are careful not to exceed the output per man, per week, previously established. Indeed when that former output is reached by a worker before he has put in his allotted number of hours, that worker quits work until the clock or the calendar catches up with him. In other words, for a guaranteed annual wage, the worker promises that there will be no further cost reductions, so

far as his efforts are concerned and thus no future price benefits to the consumers of the product.

It would seem to me that if an annual guaranteed wage was worth its salt to the company or to the public, it would result in cost savings which would enable the enlargement of that market and the employment of more people under similar favorable conditions.

Sabotage of efficiency because of fear of the machine. Depression psychology. But please remember that among all of our workers of 30 years of age or under, none of them have lived their working lives except in a depression atmosphere. They have not experienced boom periods, such as we older people have, when a man could find two new jobs whenever he lost one old one. Think that over. That is the psychology that management of tomorrow has to face.

Before we consider what management can do to counteract this damaging psychology, let us depart for a moment from this prosaic and unhappy land of reality and take a short trip to the magical country of the Mazuma.

The Mazuma Machine

But why go to fairyland? Just for the reason that things are so much simpler there than here. Even a child can grasp the philosophy of fairyland. The factors which enter into and affect our real machine age economy are so complex that one who attempts to follow them is likely to become lost in a jungle of conflicting ideas. Then, like one lost in a wilderness, he is likely to go around in a circle instead of taking a straight line path.

This accounts, I think, for the mistaken notion on the part of many workers that they will benefit from slowing down output. It accounts for the apprehension of certain economists as to the effect of progressive mechanization on consuming power. And it accounts for the pressure to cut the number of hours in the working week and to pass laws against overtime.

The fact that the goods and services which are so largely the product of machines are so varied and diversified, and that between their making and their consuming comes the medium of exchange, money, are complications which we can eliminate from our thinking by a process of simplification.

Let us now take our imaginary trip to this magical land of Mazuma



where there is a simplified machine age economy.

In this magical land of the Mazuma all production and services are mechanized. All of the workers operate machines which turn out Mazumas. Some turn out more, per day or per hour; some less, depending upon the individual ability of the operator and the efficiency of his machine. But each and every one turns out the same products, Mazumas.

That is all there is in the way of products and things to consume and use in Mazuma land. There isn't anything else. But it is quite sufficient. For the Mazuma itself is a unit of magical properties. It is transformable, at will, into what you may want or need. Collect a certain number of these magical units of production and you can transform them at will into a pair of shoes, a hat or a certain quantity of food. Collect a larger number and they will form a motor car, or a trip to Europe.

The workers in Mazuma land, all of whom produce Mazumas, are paid in Mazumas. They produce what they consume. But they do not consume all that they produce. Some of their Mazumas have to be handed over to Government, which they cannot do without, and to Management, which they cannot do without, and to Investment to replace old and worn-out machines with better ones as the need arises.

Workers in Mazumaland may complain, from time to time, about the shares which Government, or Management or even Investment are taking from their output of Mazumas, but you never hear of these workers practicing the slowdown, or suggesting that shortening hours will make them better off. They know that their standard of living is directly dependent upon the total output of their machines. They realize that if Government or other overhead costs go up, the way to offset it is to produce more Mazumas.

You could not preach the doctrine of scarcity in Mazumaland and get away with it.

You ought not to be able to preach it in the United States of America and get away with it either. For the general principle of more wealth for all and better standards of living for everyone which holds in Mazumaland should also obtain in our own highly mechanized machine age economy. Certainly we cannot compensate for its deficiencies by slowing down output.

I say that no one should be able to preach this doctrine. But it is being preached and it is being practiced. Why?

A Complex Economy

One reason is because we have a complex instead of a simplified situation. Instead of, as in Mazumaland, making a unified and common unit of production immediately convertible into consumption, our machine operators produce a tremendous variety of goods and services which are converted into consumption through money as the medium of exchange.

Another reason is that while our producers in Mazumaland were creating a product so flexible as to be constantly consumable in any quantity; we on the other hand are producing thousands of varied products some of which, at times, may not be consumable. It is impossible for the Mazumaland workers, for example, to produce too many Mazumas; it is quite possible for us, in the matter of fact land of reality, to produce a surplus of shoes or of wheat.

However, as soon as we attempt to cure this situation of surpluses in occasional lines by slowing down output in general, we are in the same category as the gentleman who had his head chopped off in order to cure his gout.

Still another complicating factor in our economy is the necessity of pricing the products of production. In Mazumaland this was done automatically, for each unit had the same value. In our practical economy, price comes in between production and consumption. Based, as it must be, upon competition, this gives rise, in sick or overproduced industries, to price and wage situations which penalize wage earners by imposing low consuming power upon them. Attempts to remedy this situation, even by the most militant unionization seem futile, as, for example, in the bituminous coal industry or in the building trades.

All of this sounds like a brief for the New Deal theory of Government—regulation of hours, wages, prices and production quotas. But I assure you, it is not. Like the man who had his head chopped off to cure his gout, regimentation would indeed inflict worse ills upon us than do the laws of supply and demand. The latter, at least, are not influenced by political considerations. To turn the economic futures of a people over to politicians with the expectation that they can encompass and manage these tremen-



... WHAT! No more from the

dously complex factors to the advantage of humanity is comparable to the suggestion of turning the management of General Motors or United States Steel over to a high school graduate, or even to a professor of economics. You know how far they would get with that!

What Is the Answer?

If we hope to remedy this situation, and it must be remedied if we are to hope for a preservation of our American system, it must be done by those who are qualified, through an understanding of the problems of industry, to properly appraise causes in terms of effects. It must be done by the men who are now in responsible charge of industrial undertakings and who have won their spurs in the battle of private initiative and by those who are now winning their spurs and who will occupy these positions ten years hence. Mark my words: If private initiative and private management do not tackle this job, Government will and must. And if Government takes over the plow handles, there will be no turning back until the last vestige of our system of private enterprise and initiative is turned under the sod. I do not think that American labor wants that any more than does American management and ownership.

How and where can our business and industrial leaders start to tackle this job? Certainly not along the broad front of wages, prices, production quotas and consuming power. That would be tackling too big a job even for skilled and experienced men. No, the thing to do is to concentrate



new machine than from the old?

the effort at least at first, upon that which can be done and which, if done, will give promise of most effect. Concentrate upon the problem of technological displacement. If we can make a dent in that it will cure the slowdown and create a new labor attitude toward the machine. That, in turn, will put the doctrine of scarcity on the scrap heap.

Management, representing ownership and investment, through acts both of commission and omission, is largely responsible for the existence of this present-day worker psychology.

Through acts of commission, such as the unwarranted shaving down of piece work rates and the speeding up of output without corresponding increase in wages, it has led labor to believe that it is penalized instead of benefited by improvement in mechanization.

It has made its greatest mistake, however, through acts of omission. It has failed to interpret the formula of efficiency gains and their beneficial results to labor and to the public. It has failed to present the facts because it has neglected to secure the facts.

Management has done a very poor public relations job for the machine. And there is indeed a very good case that can be made for it in the court of public opinion.

The Price Angle of Mechanization

The public interest in mechanization, which affects every one of our 120 million people, comes in in the relationship between machine improvement and what the consumer

has to pay for machine made products.

We are being subjected, nowadays to a barrage of conflicting theories as to whether prices should go up or down and to a great deal of talk about the damaging effect upon the consumer of "monopolies" and big business and industry. But we have not been presented with many facts. I am going to give you some. They have to do with the "price effect" of mechanization.

The machine, you will agree, is most intensely in evidence in our big mass production industries, which, incidentally, are those most frequently subjected to political attack as being damaging monopolies. Since these industries provide the larger share of employment and since their wage scales run above the average and since they pay the lion's share of taxes, it cannot be meant that they are damaging to the worker or to Government. The inference is that they are unfair to the public, the consumer, because of their price policies. That because of these price policies, the consumer is unable to buy as much or as many things as he should if the efficiency gains due to cost reduction were properly shared with him.

Let's examine the Government record of wholesale prices. These, as you know, represent the producer's performance.

Between the period of 1923-25 and 1935, or approximately 11 years, the price of vacuum cleaners has been reduced 50 per cent; washing machines, 50 per cent; plate glass, 60 per cent; auto tires, 55 per cent; women's silk hosiery, 58 per cent; petroleum products, 40 per cent; hot rolled annealed steel sheets, 38 per cent; electric power for domestic consumers, 30 per cent.

The average price reduction for all of these diversified mass-production and so-called monopolistic products, over that period, was 48½ per cent.

But, someone may say that the price level of all goods and commodities dropped between 1923-25 and 1935. And that these commodities were merely following the downward procession.

Let's examine the Government record again. According to it, the average drop in all commodity prices during that period was 20 per cent. Therefore, in addition to following the downward price trend, the industries manufacturing these products

passed an additional 28½ per cent price dividend to their consumers.

Now what does this mean?

It means that the American consumer, the American public, if you please, has a vital interest in seeing that there shall be no halt in the progress of machine improvement which has been primarily responsible for conferring such benefits.

And consider this: The average rate of the gain of efficiency in our manufacturing industries between the period of 1923-25 and 1935 was 3 per cent per annum. Under what might be called normal conditions, this efficiency gain should have been divided, in some as yet undetermined proportion, between ownership, labor and the consumer. What has happened? With respect to the products I have mentioned, the consumer has been given a benefit, in price reduction, over and above the normal price trend, of close to 83 per cent of the entire average savings attributable to the improvement in production over the entire period in the whole of manufacturing industry.

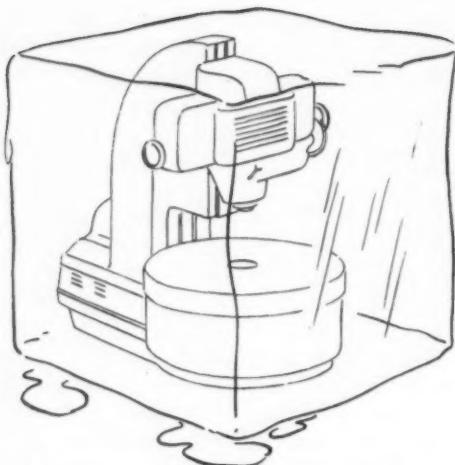
Taxation Versus Technological Displacement

If the average American worker could be shown the fact, he would realize that increase cost of Government is a far greater threat to his well-being, his wages, his employment and his purchasing power than is increasing mechanization. Mechanization is not in competition with the worker; it is his ally in helping him to earn more. Government cost has nothing to give him but plenty to take away from him. Government can make the worker plenty of promises, but it has been short on performance. I have yet to be shown any specific instance in which legislation has actually benefited the worker through the increase of his actual annual purchasing power.

On the other hand, I can show you many instances of where mounting cost of Government bureaucracy has penalized our workers in private industry for the benefit of those on public payrolls.

Let us take, for example, what is perhaps the most aggravated case of technological displacement; of men being forced out of work by machines, that we have on record.

Prior to the invention of the automatic cigarette making machine and its commercialization in 1909 there were something over 100,000 people engaged in making cigarettes. Mak-



... PROGRESS frozen into a status quo.

ing them largely by hand. Along came this highly mechanized device which was almost laborless. The number employed in cigarette making dropped from 100,000 plus in 1904, to less than 25,000 in 1935. More than 75,000 people deprived of jobs.

I am not going to talk about the secondary employment generated by the increased use and distribution of cigarettes which put thousands of clerks to work to take care of public demand for a cheaper and better cigarette. I am simply going to call your attention to the fact that Uncle Sam, today, puts a consumer tax of 6 cents per package on each package of 20 cigarettes, retailing for approximately 15 cents per pack.

Seventy thousand people deprived of jobs in one industry by an automatic machine.

But let me call your attention to the fact that cigarette taxes brought the Government, in 1935, over \$350 millions in taxes. Enough to pay a salary to an equivalent number of the displaced workers amounting to approximately \$4,500 per man or woman per year. Enough to pay for the salary, on Government payroll, of political hangers-on and henchmen to the number of approximately 150,000. Let us hope that some, if not all of the displaced cigarette workers, secured some of this juicy Government employment gravy. I am afraid, however, that most of it went to politicians' friends and relatives.

I am not citing this as an indictment of Government taxation, nor as an argument for relieving companies, such as tobacco concerns of a revenue impost on profitable mechani-

zation. But consider this point. That invention and mechanization, in addition to helping the producing companies to prosper, enabled the Government to extract, painlessly, many billions of dollars from cigarette smokers, over the long period, without raising their cost of smoking. The companies prospered, the Government prospered, the consumer was enabled to have a better cigarette at no more cost. Every one prospered except the poor 75,000 unfortunates who found themselves out of jobs. If only a half, let us say, of the Government pluckings in this case had been devoted to alleviating the cases of these displaced workers, they might indeed have had a different attitude today toward improved production machinery!

Every dollar of increased taxation means one dollar less to reduce prices of products to consumers or to raise wages of workers.

In 1934, the Westinghouse Electric & Mfg. Co.'s tax bill was \$2.5 millions. In 1935 it was \$5 millions; in 1936 it was nearly \$9 millions. For 1937 it will be over \$16 millions.

The tax bill of Bethlehem Steel was \$6 millions in 1935 and \$19½ millions in 1937.

Take the case of a smaller company, and one nearer home. The increase in taxes paid by Ludlum Steel Co. in 1937 over 1935 was sufficient to have paid the wages of approximately 700 of their mill workers for a six months' period of employment.

What chance has an industrial economy, which makes an average gain in efficiency of not more than 3 per cent per year against a political economy which eats up savings through taxes at an accelerating rate of nearly 100 per cent per year?

Mounting taxation is steadily sabotaging our efficiency formula and making a quicker and more thorough job of it than is Communist action. Our golden goose lays plenty of golden eggs, but a constantly increasing horde of tax collectors are continually rifling the nest.

When the Government, as it does in New York State, slaps a tax upon the consumer of 4 cents on a gallon of gas, or approximately 25 per cent, it eats up the lion's share of the benefits which the gasoline industry would otherwise have passed on to the general public. The same thing is true when it puts a 6-cent tax on a package of cigarettes which retails for 15 cents. These taxes become a part of the direct cost of consumption and

are borne by our 120 million American consumers. And they are only a visible fraction of the almost endless chain of taxation which reaches from the finished product all the way back to the raw materials entering all of our products.

Political Mechanization

The increase in Government cost, Federal only, during the period in question, has amounted to the staggering sum of \$7.7 billions, which amounts to \$285 per American family. Mind you, this is price increase only. It represents what a blundering bureaucracy has done to offset industry's effort to benefit the consumer. It would be well for all Americans to ponder this fact before they accept the popular demagogic condemnation of the machine, of mass production and of the bogey of monopoly. Every dollar added to the cost of Government offsets a dollar of cost saving and deprives the consumer, the worker and the investor of their possibility of participation in it.

The public interest in machine improvement is paramount. The sooner the American consumer realizes that the fruits of mechanization, shared with him as mass industry has done, represent his one safeguard from being stripped bare by mounting taxation, the sooner will we be on the road to recovery.

How are we going to counteract this insidious psychology and its spread inside and outside the ranks of labor?

That is one of the most important problems that management has before it today. First we must become alive to the necessity of obtaining facts.

Facts about what happens to manpower in your plant when additional machine power comes in the front door. Does it push men out of the back door? If so, what becomes of them? Does the incoming of improved machines create a new market for labor which exceeds the market for labor which existed before the improved machine came in?

You have all had to let men go because of the present depression just as you had to let them go during the two previous downturns since 1929. Have you kept a record of just how many of this number were forced out by machine improvement and how many because you did not have enough work to keep them busy? Have you kept a record of the relative shrinkage of machine hours as compared with man hours during a downturn? I do not think that you have.

but I believe that such a record would go far to disprove conclusively that the technological factor is a primary cause of depression because it would show during depressions a greater percentage increase in the idleness of machines than of men.

Do you know the facts showing the long term record of your company and your industry with regard to what it has done for labor, in employment and wages, and the customer in the way of prices and for the tax collector in the way of taxes? You ought to have these facts drawn up in orderly array for some day there may be need to have them march to Washington to prevent some starry-eyed but misguided and misinformed enthusiast from further sabotaging the efficiency formula.

Private industry must collect these facts and present them to the public and to workers in industry. That is the first job and the first step in counteracting and changing the attitude toward the improved machine. True enough, the Government records show conclusively that mechanization has steadily created more jobs per 1000 of population, up to 1930. But that is not enough evidence and it is too remote. The worker who loses a job does not examine the Government records, he blames his misfortune on the plant and management for which he worked. And the spectre in that plant, to him, is the machine.

Facts First, Policies Next

The first step, then, for management, in this matter of technological displacement, is to find and present the facts. The second step is to formulate a sound policy based upon the facts revealed.

So long as we follow our basic efficiency formula and so long as inventors and improvers of machines have ideas and are permitted to put them to work, men are going to be removed from their accustomed jobs by changes in processes and methods. It is part of the law of growth even with living organisms that old cells shall be discarded and new ones formed. We can't stand still without going backwards.

We can, and must, however, unless we are willing to see the efficiency formula discarded or sabotaged, work out a policy that will soften the effect of temporary technological displacement upon the individual who faces it. We must try to see to it that the new machine, either directly or indirectly, boosts the man up instead of pushing him down.

What such a policy would be or should be I do not know, nor do I think that anyone else knows, because we have not yet taken the first step of getting the facts. Nor do I think that, even if such a policy were developed and accepted, it could be put into effect during a period of downturn such as the present, when national as well as private income is diminishing and debt increasing. Such a thing as this must be effected during an upturn. But we must begin thinking about it now.

The very fact that private industry was giving serious consideration to this problem would in itself, I believe, help to improve worker and public opinion with regard to both industry and the machine.

Nor will management have to turn itself upside down or make an about face to get into the frame of mind to consider this problem. All that it will have to do is to transplant into the factory the sort of thinking that is now being done in our modern sales department. It must think primarily of customers.

Seventy per cent of all of America's buying power comes from wages. When an improved machine comes into a plant and displaces labor without conferring a benefit upon consumers sufficient to create buying power equivalent to that of those displaced, somebody loses a customer. You may hope that the one lost is somebody else's customer, but the probability is that somebody else is doing the same thing to one of yours, too.

That does not mean that we should not install new and better machines. No company ever succeeded which did not do that. But I know of no successful company, and I would like to hear of one, which over the long term of its existence made a success by employing less and less people.

It does mean, however, that if it is to be a real success, the new machine must create customers as well as profits. Create more buying power

• • •

... CAN you show the record of your business in the employment of men and machines?

• • •

than it displaces. That is nothing more than plain common sense.

It may create this additional buying power in any one of several ways. It may enable the operator to produce more and earn more. That's buying power. It may reduce the price of the product to the general consumer. That's buying power. It may increase the quality and appeal of the product and thus open pocketbooks that would otherwise stay closed. That's buying power.

You can't afford to lose too many customers. There was a Chinaman in San Francisco who ran a fruit stand. He would say to passersby—Good buy. No buy? Good bye. Believe me, when enough customers say good bye to you, you are going to say good bye to your business.

Thoughtful employers throughout this country are anxious to tackle this problem and realize its great importance. Let me quote from two of the many letters that I have received the past few days on this subject.

The first letter comes from the president of a large electric equipment company and bears upon the necessity of finding the facts.

I quote:

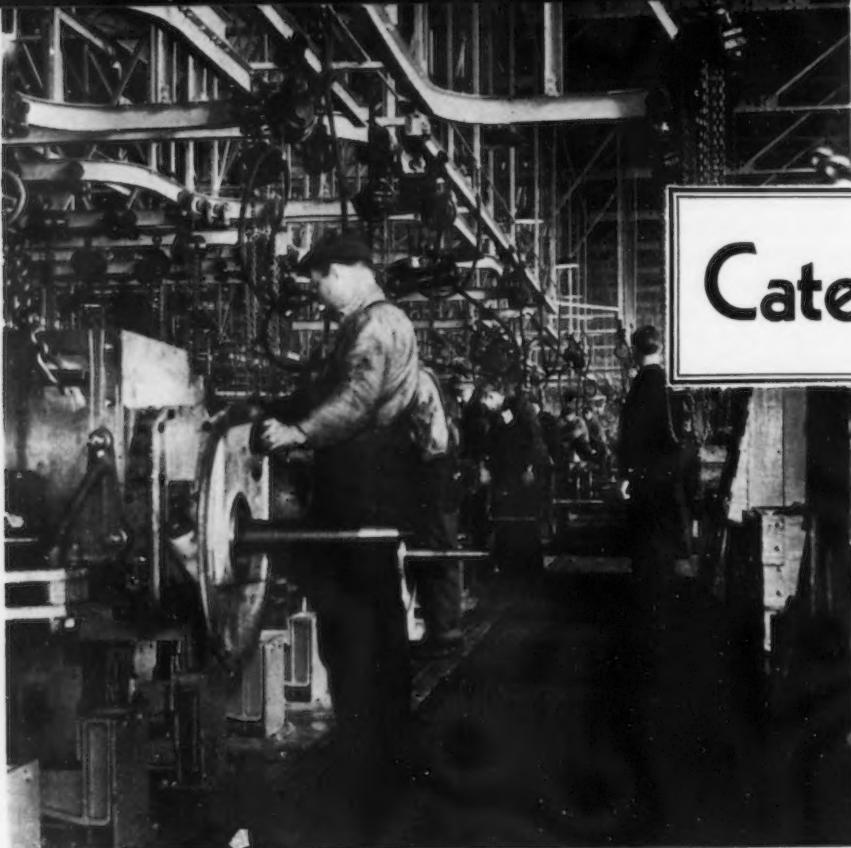
"I am entirely in accord with your editorial in the March 3 issue tending to prove that technological progress increases rather than decreases employment.

"With respect to our own company, we have made constant improvements in our methods of doing work, but cannot recall a single instance in which such progress threw anybody out of work or even reduced a wage rate.

(CONTINUED ON PAGE 81)

MY BUSINESS		
	MACHINES	MEN
1920	10	12
1924	15	22
1928	40	75
1932	60	100
1936	72	190
1938	200	465





GENERAL view of the assembly line, showing nature of supports, overhead monorail conveyor, and air tool suspension.

Caterpillar's New

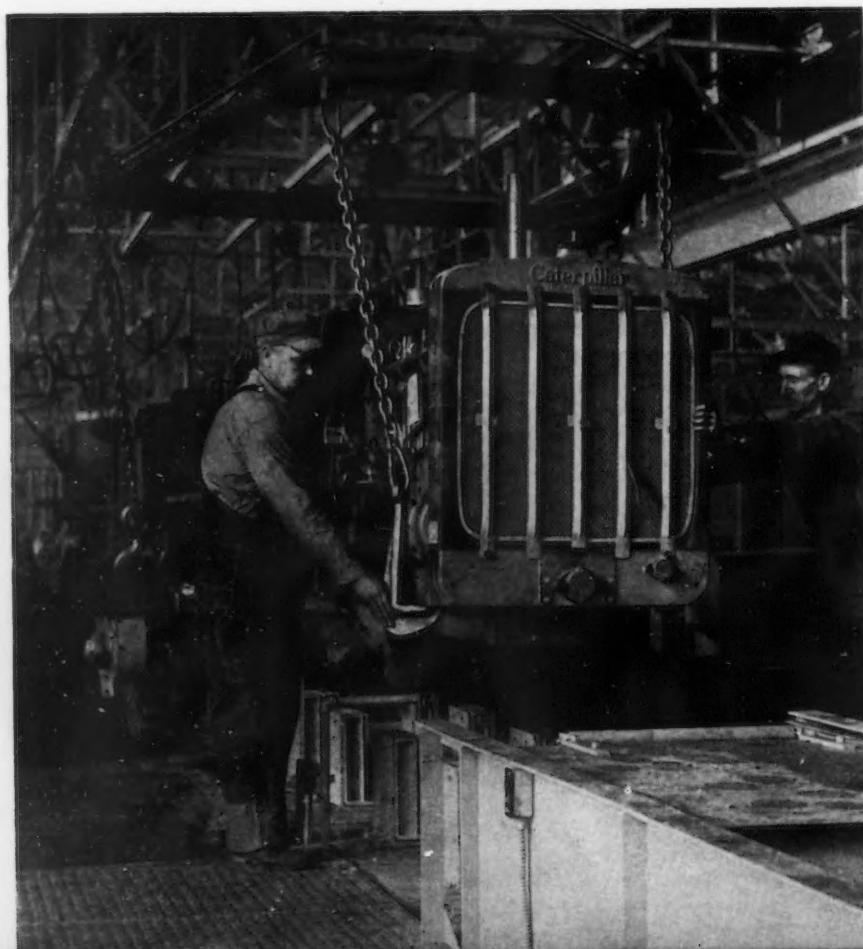
A RECENT progressive step taken by the Caterpillar Tractor Co., Peoria, Ill., was the installation, late in January, of a power line for the assembly of tractors.

Capacity of the new line is 50 tractors an 8-hr. day, with line speeds ranging upward from 6 in. a min. Production is increased simply by adding more men to the stations along the line, which affords along its length 368 ft. of working space. Three sizes of diesel tractors are being assembled on the new unit. Another power assembly line similar in design is being constructed for two additional smaller models.

The different models are varied in order on the line so as to maintain a continuous production of each model.

Designed by company engineers, this is the first power assembly line for tractors that "Caterpillar" has used, although for several years diesel engines have been so assembled. Tractors originally were assembled on a hand operated line—that is, they were pushed along on dollies and parts were added from banks of parts along the line. Feeder lines were used much as they are now on the new line to provide minor assemblies. Tractors are not being assembled by other methods at the present time.

The moving line consists of 284 supports spaced $3\frac{1}{2}$ in. apart on a steel flooring. Each support is 18 in. high, and is mounted on a four-wheel dolly which runs under the surface on narrow-gage rails. The line being endless, the supports and dollies travel on the rails only while actually supporting the work in progress, and move inverted under the rails back into the upright position. Power is provided by a 2 hp. electric motor with a transmission reduction of 1400 to 1.



THE end of the assembly line, prior to being fitted with roller tracks.

Assembly Line

By ROBERT BINGHAM

Western Editor,
The Iron Age, Chicago

In assembling the three- and four-cylinder tractors, five supports are necessary, whereas the six-cylinder tractor requires six supports, the speed of the line and its capacity varying according to the sizes of tractors on the schedule.

Assembly begins with the transmission cases which are transported by overhead trolley to a roller conveyor at the starting point of the power line, where they are thoroughly cleaned and wiped while the final drive gear shaft is placed into position. Between the roller conveyor and the moving supports of the power line is a specially designed 5000-lb. hydraulic press which presses the final drive shafts into the proper position, after which the lock nuts around the shafts are drilled, tightened and locked. The draw bar brackets and studs are then tightened to the case by air wrenches, and the final drive gear shaft plates are located in position and tightened.

At this stage, just before a 6000-lb. hoist places the cases on the power line, the main frame is bolted to the 6-cylinder models.

The first operation on the power line proper is the hoisting and placing in position in the transmission case of the final drive gear shaft pinions, seven capscrews on a side being tightened by air wrenches.

Air tools are used extensively on this line, all tools swinging from specially designed monorail conveyors above head height but within easy reach at the particular sections of the line where their operation is necessary.

Electric motor driven air compressors located elsewhere in the plant, provide air at a pressure of approximately 90 lb. a sq. in. for driving the air tools, nearly 140 of which are in use on this line. At least 90 per cent

of the nuts and cap screws are run up with these tools and then given a final set up with a hand wrench.

As the transmission cases move onward, the bevel pinion shaft assembly, upper transmission shaft assembly and the gears are brought to the power line by an overhead trolley conveyor and located in the case, and the transmission case front end cover is placed and tightened.

Depending upon the size of the parts, overhead or roller conveyors are used to supply the main line with the necessary parts for assembly.

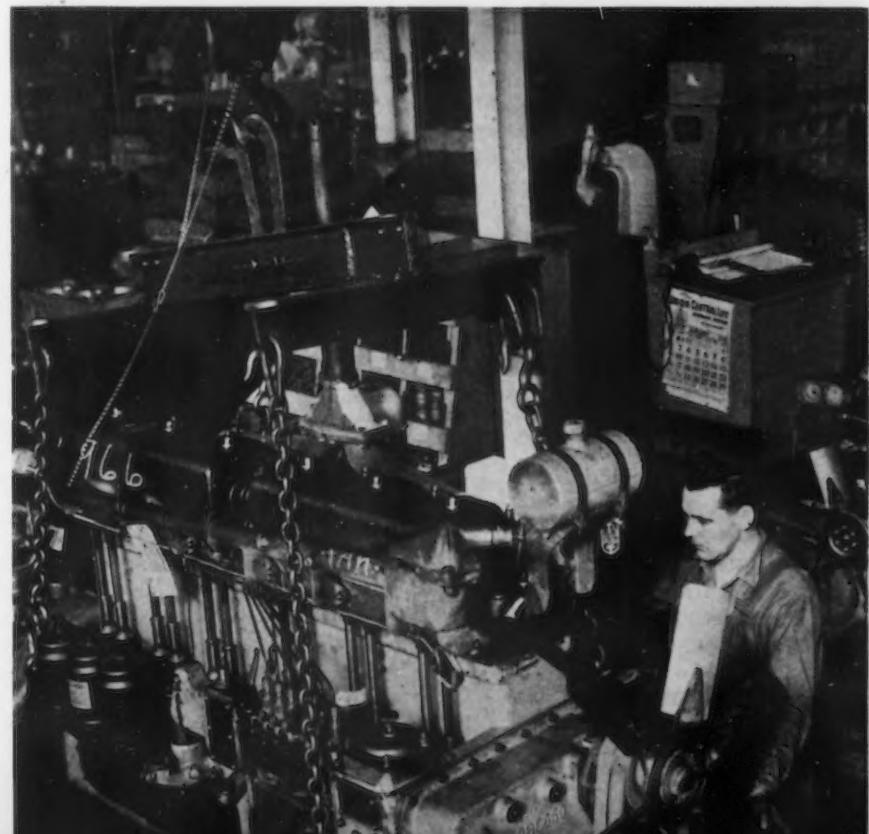
An overhead hoist drops the steering clutch and brake band assembly into position and all final gear adjustments are made. Oil seals and

guards are tightened over the bevel gear, special care being taken with the oil seals in the assembly of the bevel gear cover as leaks must be prevented.

Continuing down the line, the steering clutch throwout forks are assembled in the transmission case, and the steering clutch outside drum bolted to the final drive gear flange. The brake pedals are assembled, and the flywheel clutch is placed in location on the upper transmission shaft, after which the clutch is assembled and adjusted.

A further operation includes the assembly and placing of the gear shift lever, fork and lock rails. The final drive sprocket is assembled and

LOWERING diesel engine into place in tractor chassis.



placed, and an oil seal bellows of a type specially developed by the company for this particular purpose is fastened to the sprocket. Roller bearing adjustments are made before the bearing cover is bolted on.

An overhead cross crane equipped with a 10,000-lb. air hoist transports the motors to the assembly line where they are placed and bolts and cap screws tightened by air wrenches.

overhead tanks and runs by gravity into the tractor. Oil for the final drive gear cases and oil for the transmission, steam heated so that it will flow rapidly, is pumped directly into those compartments from underground tanks. This being the final stage on the power line, the tractor, completed except for roller truck assembly and tracks, is subjected to a minute inspection and final adjustment.

by means of a special winch the track is assembled about the drive sprocket and a master pin is driven through the male and female links in the track and tightened.

After further adjustments, the tractor is run on a test block where it is anchored by the drawbar and run for a sufficient length of time to loosen the tracks, to run in the transmission, and to check for oil leaks. The diesel engine itself has already been completely checked and run in.

The new line has not yet been in operation sufficiently long to determine whether actual output has increased, but such, according to the company, was not the purpose of the installation. Better work and better working conditions in addition to an increased safety factor were said to be the major considerations.



BASE upon which tractors are fitted on to roller track assemblies. Immediately following this operation, the tractor obtains its roller tracks and is completed.

A roller conveyor brings the transmission top covers for assembly, while the placing of the radiator assemblies is facilitated by an overhead trolley system. An additional set of rollers carries the sheet metal fenders and floor plates to the growing tractor.

Another overhead conveyor is put into use at this point, the tractor seat and fuel tank being swung into position by this method.

A separate operation includes the oiling of the tractor. Lubricating oil for the engine, and fuel oil for the fuel tank is pumped electrically into

ments are made. Throughout the progress of the machine on the line three inspectors constantly check and observe operations.

Although the power line itself is at an end, the assembly of the tractor is not yet complete and a 16-ton overhead traveling crane fitted with a 3-ton auxiliary lifts the tractor on to the roller truck assembly, which is bolted to the tractor chassis.

The tracks are laid out in front of the roller truck assembly base and the tractor under its own power runs from the base on to the tracks where

Delco-Frigidaire Markets Unit Air Conditioner

A NEW type of unit air conditioner for residential, office, hotel, hospital and similar uses, which embodies the "meter-miser" mechanical principle first applied in the refrigeration industry, was recently announced by General Motors' Delco-Frigidaire Conditioning Division, Dayton, Ohio.

Designed from the ground up in the air conditioning research laboratories of General Motors and the Frigidaire Division in Dayton, the new unit went into production recently and will be introduced to the public early in April for pre-hot weather installation. It will sell for \$399.50 completely installed. The new unit looks much like a console radio cabinet of extraordinarily compact size. It has finger-tip dial control, and cools, dehumidifies, cleans, circulates the air and provides year 'round ventilation. It is portable and requires no installation work except the connecting of the power circuit and the fitting of an adjustable window section.

The Engineering Foundation, New York, which sponsors and assists in a wide range of fundamental research projects, has issued its annual report for the fiscal year of 1936-1937. In addition to memorials to Ambrose Swasey and Dr. Alfred D. Flinn, the former the founder and the latter director of the foundation, the report includes financial statements and data on current activities.

Cast Composite Tool Steel

What is it? How is it made? And what are its market possibilities?

• • •

By W. J. and STUART GREEN

Philadelphia

• • •

AMERICAN steel makers visiting England and making a tour of British automobile and industrial factories, are often completely surprised by the wide use there of "cast composite tool steel." These American visitors are usually surprised again in finding out that several Sheffield steel makers have developed this tool steel specialty to a point where it now is their principal item of manufacture. The Sheffield makers have been at it for nearly a century, their aggregate output now is comfortably large and the market prices are quite profitable.

Curiously enough the sale of this product in the United States is not yet appreciable. A tariff of something like \$100 a ton mitigates against the importation of the English product, and at present only one, or certainly not more than two, American firms are in a position to make it here. Because of this interesting situation, the writers will attempt to outline in sketchy form something of the essential facts of the product and its market possibilities.

First then, what is cast composite tool steel? The product as made by Sheffield steel firms is here loosely defined as an inseparable unity of two *fluid* steels, one of tool steel quality and the other a soft supporting steel sufficiently low in carbon as to be outside the hardening range. The two

steels are poured in a mold of suitable design and the ingots are subsequently cogged into billets and rolled into desired sections in the normal way. The method of pouring together two *fluid* steels is the preferred Sheffield way because of the great strength of bond or weld that results—rather than, for example, the pouring of mild steel around a *cold* tool steel insert or bar.

The proportions of tool steel and mild steel as well as the location of the tool steel are matters of wide choice. The illustrations in Fig. 1 show typical sections. Perhaps the widest call is for one-third tool steel and two-thirds mild steel, though the half-and-half section runs a close second. Corner-gated sections are also in reasonable demand, with the tool steel occupying one corner of the ingot. The major tonnage (in England) will be found, however, in the half-and-half and the one-third and two-thirds sections.

To continue, it is interesting to examine the uses the English have been putting this product to, in order that American market possibilities may be more adequately gaged. As most readers have guessed or already know, the simple purpose of this procedure is to provide an extremely hard tool steel surface supported or cushioned by a soft steel back. With such a steel, piercing, drawing and forming dies, for example, can be given a glass-hard

working face of extreme longevity and high efficiency, yet at the same time be adequately supported against shocks and fracture by an ample soft safety back. Certainly an ideal product for innumerable uses, and a very logical "new-comer" in the American specialty tool steel picture.

Even the casual reader can envision many manufacturing applications of this combination of glass-hard tool steel with soft safety back. Shear-blades, blanking, piercing, forming and stamping dies are principal outlets, and almost every field of manufacture suggesting additional uses.

The great strength and high efficiency of this composite tool steel in service is self-evident. There are other advantages in processing, in the making of the dies and carrying them through the critical hardening stages. Those heat treaters who have handled this product have observed that in hardening, the mild steel backing again acts as a cushion against hardening strain—thus it rarely happens that blanking and piercing dies pile up in the heat treater's scrap heat. Marked also is the minimizing effect of the soft back on shrinkage and deformation under severe hardening operations. Long shear blades come through the hardening operation remarkably straight, and where some warping occurs it can be straightened with surprising safety and ease due to the

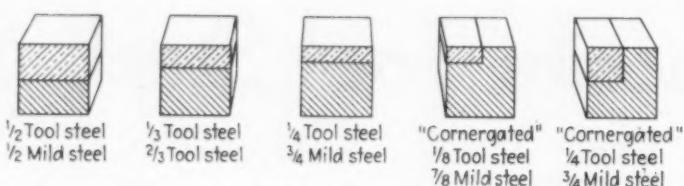


FIG. 1—A cast composite tool steel may be proportioned in many ways to suit the needs of the customer. The 1/3-2/3 combination is probably the most popular assembly, and the corner-gated sections are widely used.

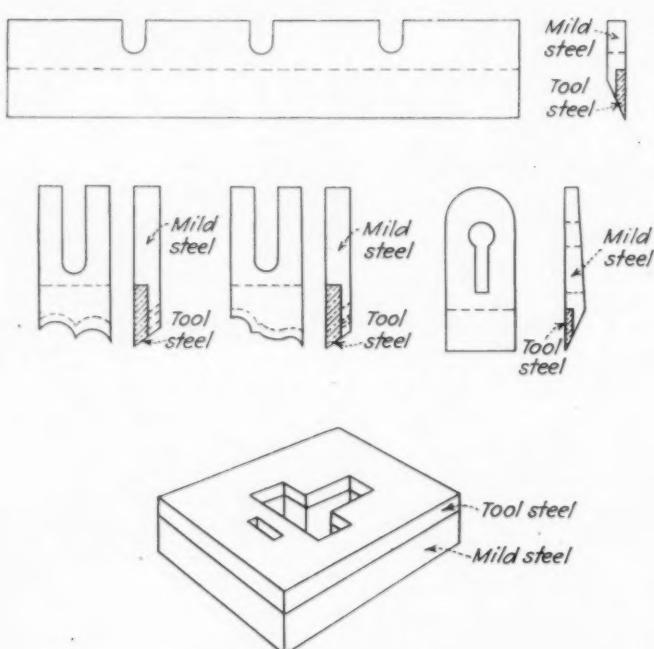


FIG. 2—Some applications of composite tool steel. It is used for blanking and forming dies, paper knives, wood-working tools, etc.

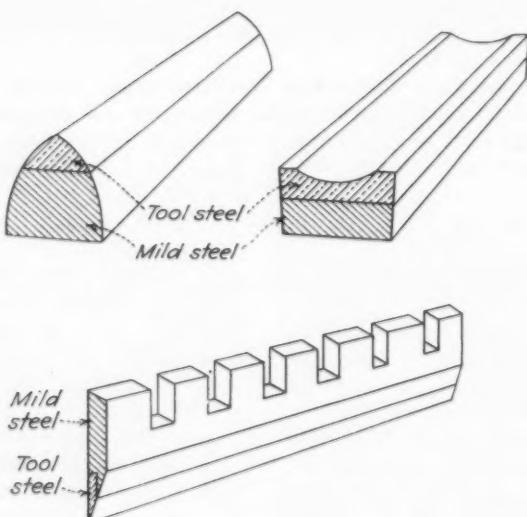


FIG. 3—The assembly of tool steel and mild steel is used for engine slides, machine tool faces, etc.

perfect bond of the hard and soft steels.

When composite die sets are finished and hardened, any desired machining or drilling of screw holes or dowels can readily be carried out in the soft steel back, and dies are easily fitted to existing press shoes, or later refitted to other shoes without the necessity of annealing the dies. Thus, considerable time and money often are saved. The illustrations in Figs. 2 and 3 show some uses other than die sets, which latter applications already are well known to the reader. A survey of the English uses, with tonnage used being in about the order given, shows the following:

Press Dies: Blanking, piercing, drawing, forming and stamping dies.

Edge Tools: Plane irons, shear blades, paper knives, heavy duty steel mill shear blades, alligator shear blades, tobacco knives, etc.

Miscellaneous Uses: Vise jaws, scale bearings, engine slides, machine tool faces, precision gages, etc. The uses collectively account for a sizable volume of steel.

In making composite assemblies, certain expedients have been tried, such as welding tool steel onto a soft steel backing. Special alloy steels with complicated heat treatments have also been devised in an attempt to meet this "hard-soft" requirement, but these processes do not seem to have the versatility of the simple method of pouring two steels together in the one ingot and simply rolling the assembly to the desired sections. Those who have not witnessed this method sometimes wonder whether the soft and hard steel will flow evenly when rolled. Surprisingly enough, they do—and the finished bar has precisely the same proportionate section as the ingot from which it is made.

The writers have made many hundred tons of this cast composite tool steel in Sheffield and have developed simple molds necessary to its easy accomplishment by any ordinary pit crew. The illustrations in Figs. 4 and 5 show how direct and simple the procedure is. The designs are covered by United States patents, but those interested may readily arrange for the use of this mold design by writing to the authors.

The modern electric furnace, either arc or induction, lends itself readily to the production of composite tool steel. Either one or two furnaces may be employed. Where one furnace only is used, the mild steel section is first poured. The molds are left closed to

retain the high temperature of the ingot until the tool steel heat is melted and poured. Actual experience shows that the closed mold and the great amount of heat retained produce a perfect weld even though the second heat be poured several hours later—as indeed it usually is. No weld-resisting oxidized skin develops—such as is the objectionable feature of the cold insert method. Where two furnaces are used, the smaller furnace usually handles the tool steel, the larger the mild steel, and pouring times are reasonably close together. Those particularly interested in the actual furnace practice might wish to write to the authors who will endeavor to provide such information as is needed.

Of course the casting and molds are important—relatively. Much more important is the field that seems to await this specialty tool steel in the United States at this time. Those interested might do much worse than to independently examine the British field and its tonnage, and thus get a first-hand picture of what might well be a most profitable addition to the line of a United States specialty tool steel maker. The greatest tonnage is in die steels and edge tools. Briefly summarized, the advantages are:

(1) Composite die cutting edges (or working surfaces) can be much harder than possible with solid dies. Thus composite dies can last longer and do cleaner work.

(2) Heat-treating failures are markedly less with composite dies. The soft back cushions strains, minimizes shrinkage and deformation.

(3) The soft back permits high service loads on tools without danger of fractures. Heavy steel mill shear blades safely take big bites, have high efficiency and long service.

(4) The soft back permits machining, drilling and doweling of die sets after hardening. Thus dies can be made to fit press shoes conveniently and economically.

(5) The weld or bond of cast composite steel made from two fluid steels in the same ingot is inseparable—something not always true of other methods.

Drill Pipe Refinements Are Announced by J. & L.

INTEGRAL joint drill pipe incorporating important refinements has been announced by the Jones & Laughlin Steel Corp., Pittsburgh.

As before, this drill pipe has a forged upset tool joint integral with the pipe which eliminates the conventional type tool joint, but the new de-

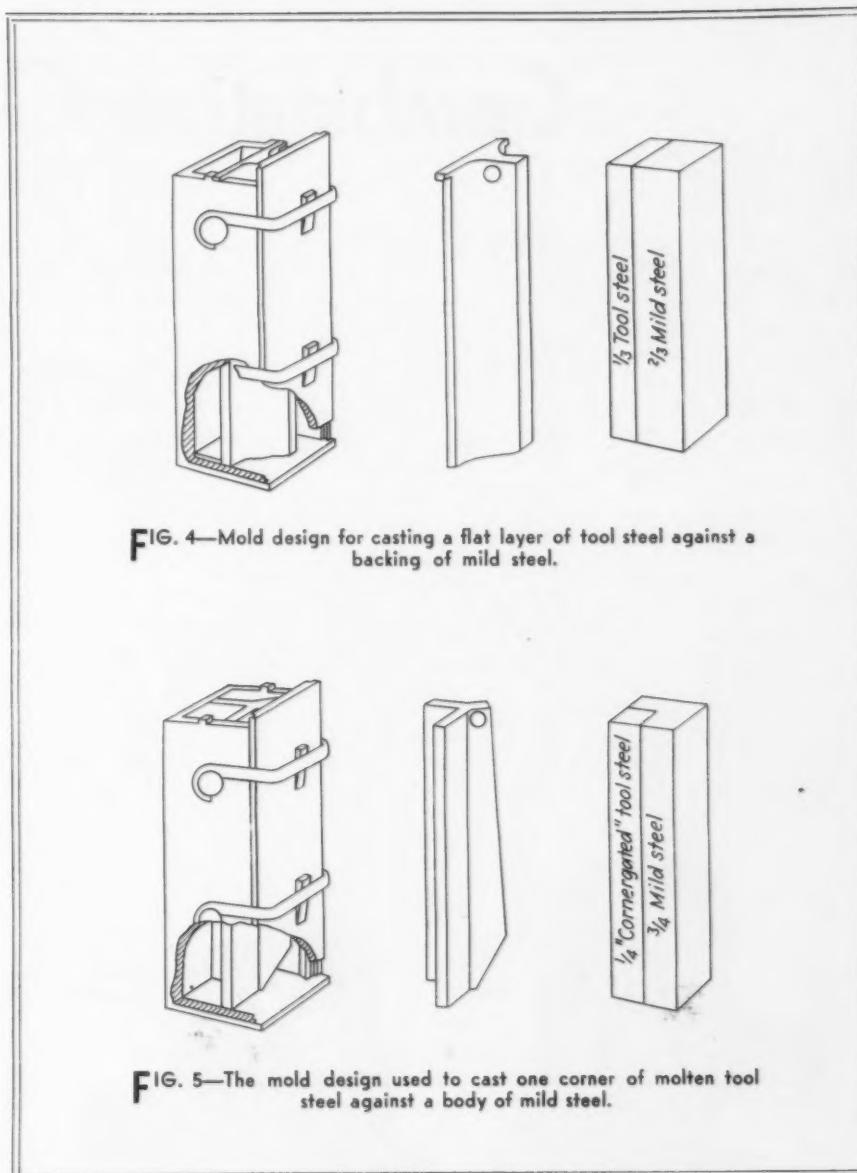


FIG. 4—Mold design for casting a flat layer of tool steel against a backing of mild steel.

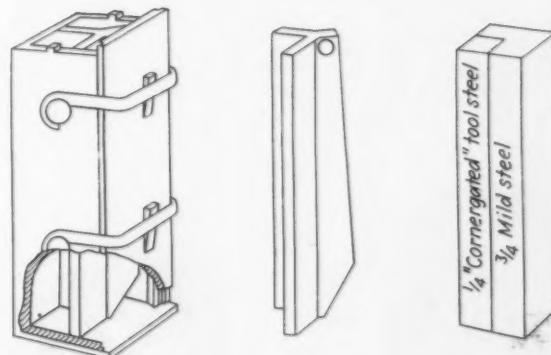


FIG. 5—The mold design used to cast one corner of molten tool steel against a body of mild steel.

sign features an increase in the overall length of the upsets on the pin and box ends, a new special heat treatment of the upset, and the use of an improved alloy steel in its manufacture.

The lengthening of the pin end of the pipe eliminates the necessity of tonging on the body of the pipe itself, thereby preventing the possibility of physical damage to the pipe by the crushing action of the tongs. Sufficient stock is provided on the upset box and pin ends for rethreading, which can be done in any oil country shop. No heat treatment is required before or after the rethreading.

Lengthening of these upset ends has been made possible by the installation of an upsetter developed especially for this work. The first of its size ever built, this huge upsetter is not only capable of forging the longer upset of the new design, but permits manufac-

ture of integral joint drill pipe in two new large sizes, 5 9/16 and 6 5/8 in. O.D.

After the upsetting and before threading, the entire joint is heat treated to assure maximum physical properties. It is claimed that the heat treatment produces a metallographic structure of exceptional refinement and results in a hardness in the tool joint end of the integral joint drill pipe comparable to that commercially available in a tool joint of conventional design.

It is stated that the improved grade of J. & L. Blue Ribbon steel used in the manufacture of this new drill pipe was made possible by changes in composition which impart structural stability without temper brittleness so that the desirable variation of properties can be accomplished with no sharp variations to form points of weakness.

Combination Operations on

ACH time the automobile industry swings into a new model year its production executives and machine tool experts take stock of the gains they have effected in time-saving and productivity. Picking out a specific illustration affords its difficulties in a field where money and effort go unsparingly into improvements. However, one example has been selected from the plant of the Packard Motor Car Co., Detroit, which has sponsored an extensive new equipment program.

Interesting changes have been made in machining the steering gear case for the Packard Eight model. Because the casting and required machining are unchanged since the previous year, operations can be compared easily. Two special machines

have replaced seven pieces of equipment, increased production two and a half times and require only one-quarter the floor space formerly used.

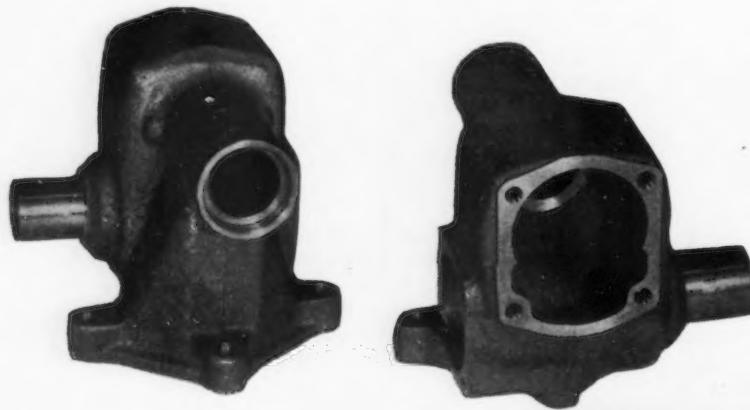
Fig. 1 shows two views of the steering gear case on which a large number of boring, counterboring, facing, drilling and tapping operations are performed. Formerly four standard turning machines, one multiple drill, one multiple tapper and one pedestal countersinking machine were used to machine the housings. To get at various faces of the part, three handlings were required for boring and drilling, three for tapping and three for countersinking holes. Production under these conditions reached 20 housings an hour.

Under the new set-up, the parts are finished in two set-ups in two Natco

machines. Net production is 55 to 65 pieces per hour. The new machines are set face to face and can, if it is desired, be operated by one man.

First of the new machines, Fig. 2, is a four-way combination borer, driller and tapper. It consists of three hydraulically actuated heads carrying a total of 19 boring and drilling spindles, one small reversing motor driving a single spindle tapping unit, and a seven-station automatic mechanical indexing trunnion type fixture. The right-hand unit of the three mentioned above carries four tapping spindles in addition to drilling spindles. Close-up of this machine in operation at Packard is shown in Fig. 3.

The companion machine is a two-way combination borer, driller and tapper with 20 drilling and 8 tapping spindles and another seven-position indexing fixture. It is similar to the other machine in general appearance and is built on welded steel bases.



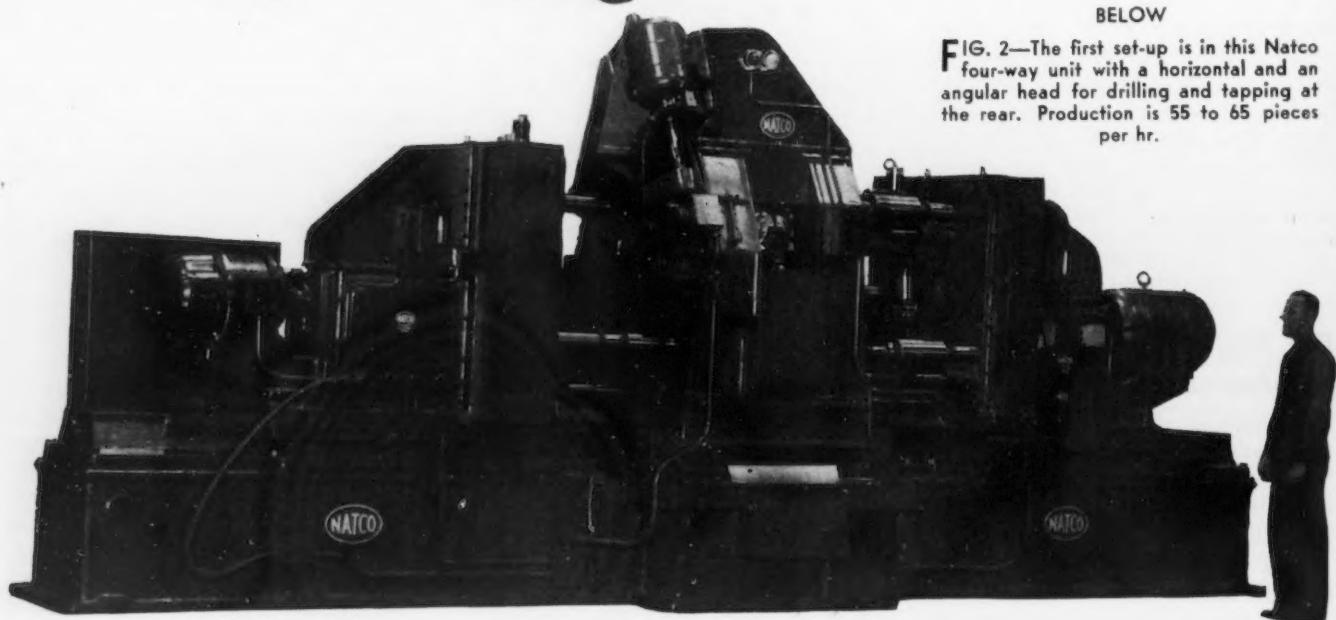
AT LEFT

FIG. 1—Two set-ups on two combination tooled machines suffice to finish this steering gear casting (shown in two views), where formerly nine set-ups were required on seven different machines.

• • •

BELOW

FIG. 2—The first set-up is in this Natco four-way unit with a horizontal and an angular head for drilling and tapping at the rear. Production is 55 to 65 pieces per hr.



Packard Steering Gear Cases

In the first unit the piece is loaded with the four-cornered bracket flange upward, so that in the fifth position a rear angular head can come in and drill and chamfer four holes in the bosses. At the sixth station, a single spindle tap threads one of these holes. The sliding head on the right-hand way performs successively rough, semi-finish and finish boring and counterboring of the steering worm upper support bearing and drills, chamfers and taps four holes for the bearing cover plate. The left-hand head rough and finish hollow mills the co-axial extension on the other side of the casting and rough and finish bores and counterbores the inside diameter for the bearing and faces and chamfers the end of the extension. This head is idle at two stations.

In the second set-up, two pieces are hand clamped at each station through two bars. Location of each casting is by studs engaging the previously finished bearing bores and clamping pressure is applied by pivoted blocks bearing against the finished face of the hollow-milled extension. The second bar clamp bears against the bearing barrel for the worm wheel. A V-shaped bottom support is first adjusted by a star wheel for variation in outside cast diameter before clamping

pressure is applied on the second bar. This arrangement can be plainly seen in Fig. 4.

For the first four indexings, no tools operate from the right-hand head. In the sixth position (the first being the loading station), a rough counterbore comes in, together with facing and chamfering tools for the bearing end,

followed by a finish counterboring tool at the next station. From the other side the left-hand head brings in successively a core drill, rough boring and facing tools, finish facing tools, semi-finish boring tools and a reamer. At the last two stations this head drills, countersinks and taps four holes for a cover plate.

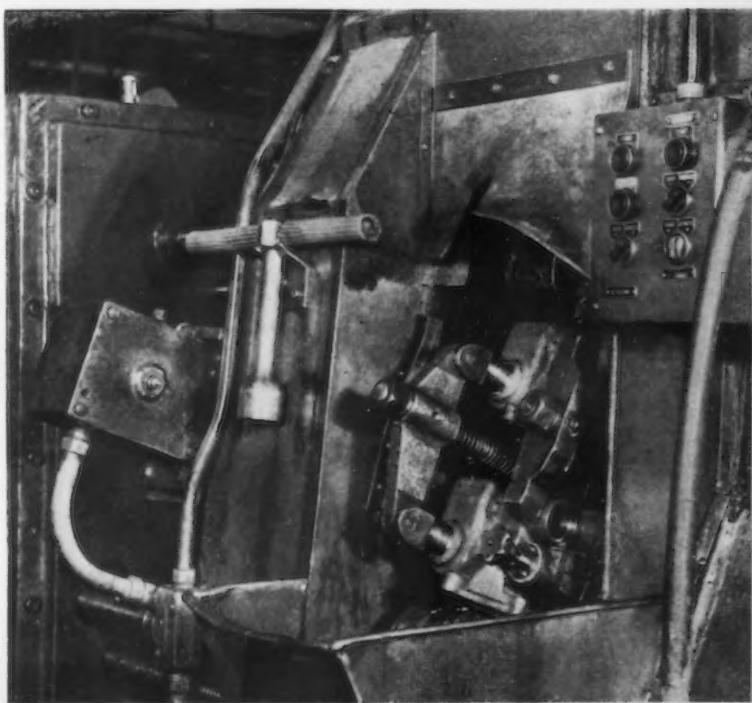


FIG. 4—In the second set-up, two castings are clamped at a time at each station, locating from the previously bored bearing. Adjustable V-block support is given the extended bearing barrel by the star-wheel adjustment, before the clamp on the right is tightened.

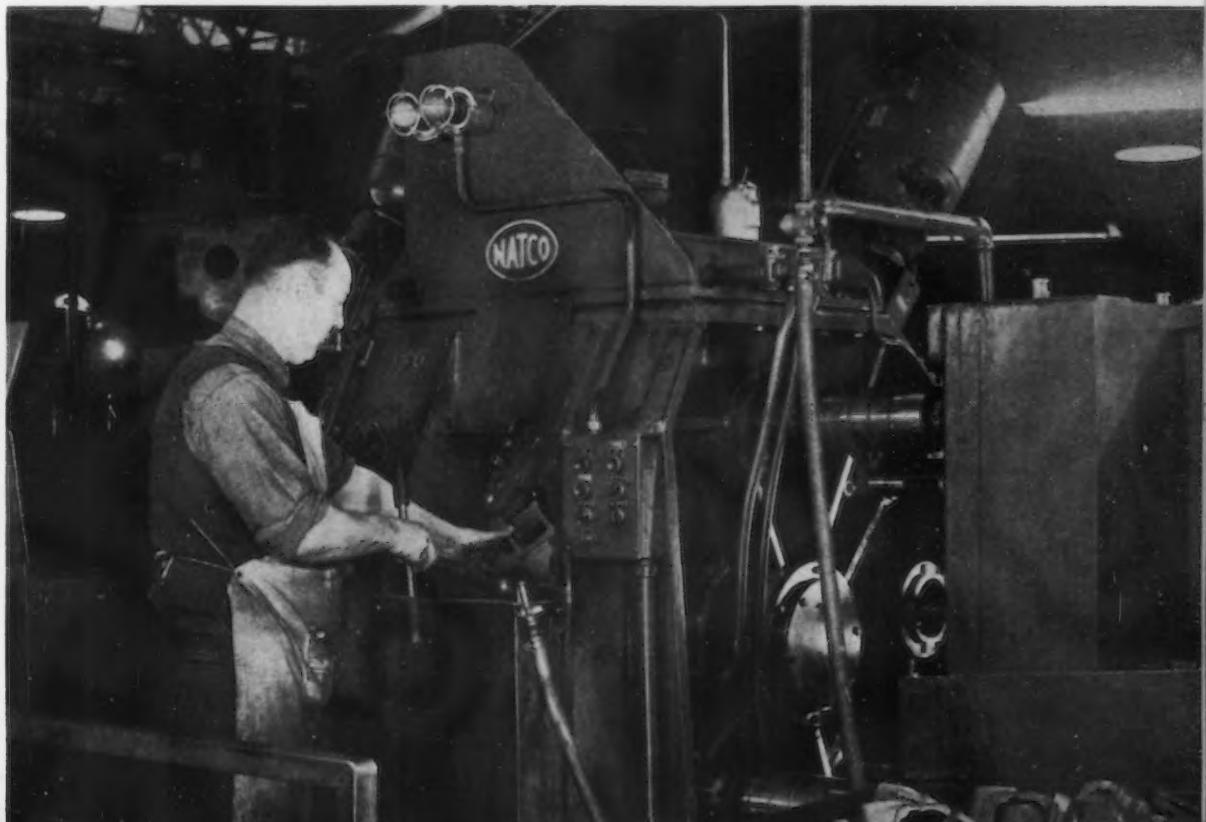


FIG. 3—Closeup of the seven-station trunnion fixture support, showing the welded steel construction and the massive pilot guide roller bearings.

Recent Developments in Presses

IN point of number, hydraulic presses of various types, from a 3-ton sideplate type to 1500-ton hot-plate unit for curing laminated materials, predominate in this review of recent announcements of the builders. Most radical design change is to be found in a gravity type hammer for sheet metal forming with new features on the pneumatic lift. Other press designs include a high-speed crank press, a massive toggle press with 180 in. be-

tween the uprights and a multiple plunger blanking, cupping and drawing machine. Among press accessories are found a pneumatic die cushion, corner notching dies and power stock straightener with variable feed drive; also a safety type electrical control panel for punch presses. A piece of equipment more useful in the steel mill is a group of side trimming and slitting equipment for coil stock, having some high-production features.

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APNEUMATIC lift, gravity drop hammer with some distinctly new features has been placed on the market by the *Pneumatic Drop Hammer Co.*, 123 Heath Street, Roxbury, Boston. It is particularly adapted for the forming and stamping of sheet metal parts through the use of low-cost zinc and lead dies, such as are used in the aircraft industry, and also for the manufacture of hollow ware. Chief feature of the hammer is an independent self-acting equalizing mechanism, consisting of cables and pulleys, that automatically adjusts the hammer head to a horizontal and evenly balanced position in spite of off-center loading or striking, thereby preventing cramping of the head on either the up or down stroke or on impact.

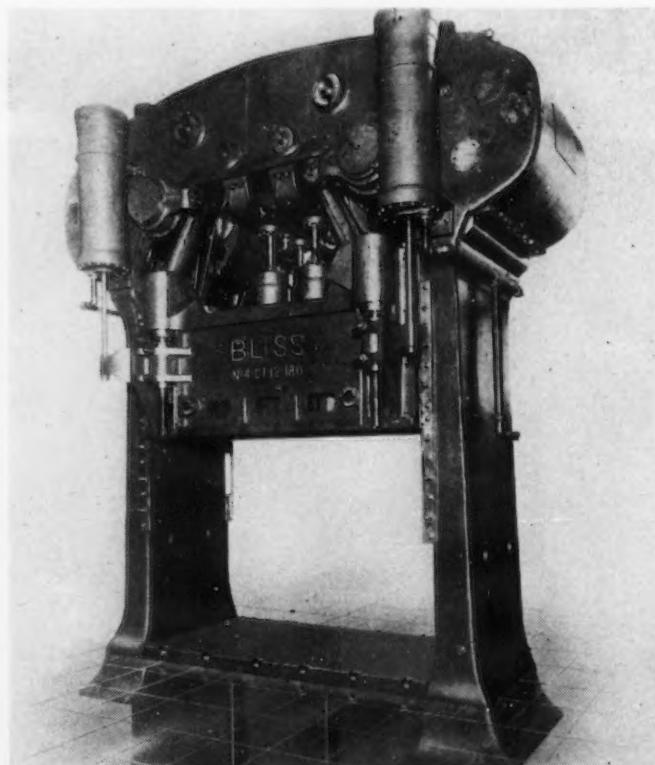
The volume of air consumed is controlled by the height of lift, and the exhaust is fitted with a Maxim Silencer to eliminate noise. The lifting cylinders, instead of being placed on top of the machine, as in former designs, are placed one on each side of the anvil, thus materially reducing the amount of headroom required. The stroke of the drop head may be quickly adjusted, and the rise and fall of the hammer is controlled by a single hand lever, so that any variation in the

length of drop or force of blow can be had for progressive drawing and dabbing operations prior to striking the finishing blow. For work requir-

ing uniform blows, the hammer can be adjusted automatically to return the head to the dropping position.

The drop head is a steel casting, drilled for die holding bolts, and in addition has conical openings for making soft metal forcers by a new technique. The drop head with holding bolts is first lowered into position on the stops and dam surrounding the lower die. The molten metal is then poured through the conical openings. The forcer thus formed may be readily removed and the cones assure perfect registration when it is used again. The head is also fitted with a dovetail opening for holding steel or other solid metal forcers.

On the anvil is a renewable steel bolster plate, dowled and keyed in place. It is machined with slightly tapered holes spaced to accommodate a wide range of dies. Maximum die space is 24 x 24 in., with 26½ in.



THE crankshafts run from front to back on this massive Bliss four-point toggle press, with 180 in. between the uprights.

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S and Sheet Metal Machinery

between uprights. For hollow wear work, the bolster is fitted with poppets for holding down bottom dies. The uprights are one-piece castings fitted with cast iron ways, adjustable for wear. A substantial yoke member ties the two uprights together at the top and supports a portion of the equalizing mechanism and the lifting speed arresting cylinders. Maximum stroke is 36 in. and the lifting capacity of the cylinders at 80-lb. air pressure is about 2200 lb.

High Production Press

The E. W. Bliss Co., Brooklyn, has recently added to its line a new high production, automatic press, designated

By FRANK J. OLIVER

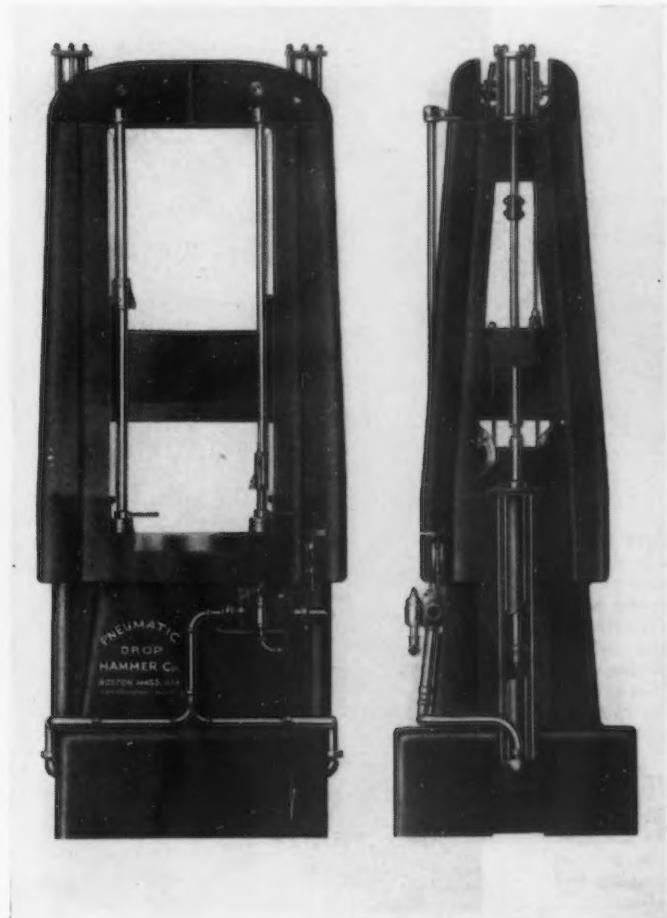
Associate Editor, *The Iron Age*

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as No. 6150-B, and arranged to operate at 30, 45 and 60 strokes per min. through the use of a 15-hp. multi-speed motor. Other arrangements permit considerably higher speeds. The distance between uprights is 60 in., while the bed area is 36 x 60 in. The crankshaft is a double eccentric type, and the slide has rigid square type gibbs, extra long and carefully hand scraped to insure perfect alignment.

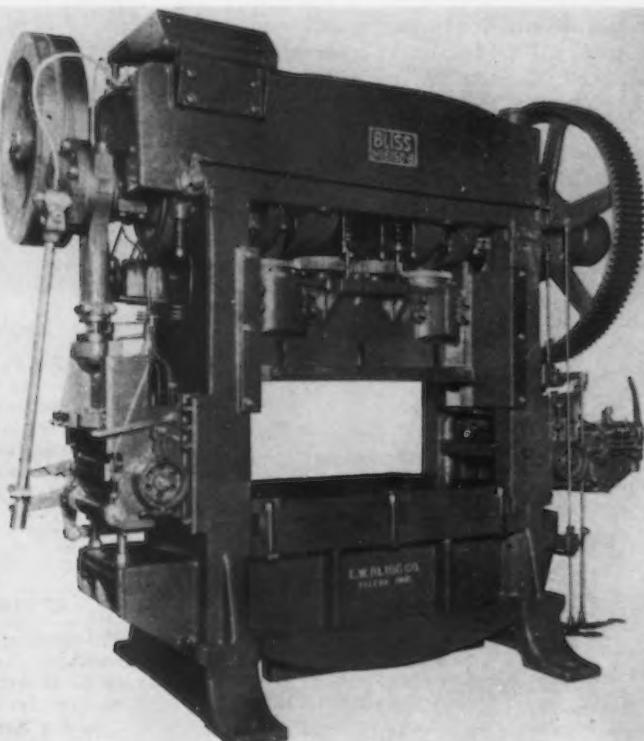
The heavy-duty precision type double-roll feed used on this press is 18½ in. wide and on the standard machine is adjustable for any feed length up to 15 in. per stroke. Combined with the feed is a seven-roll, power driven straightener, and a shear type scrap cutter, that can be adjusted for cutting clearance.

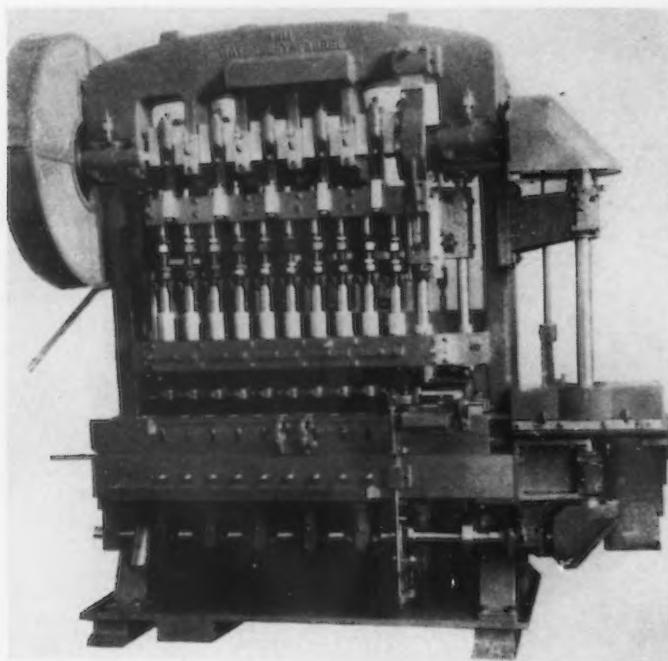
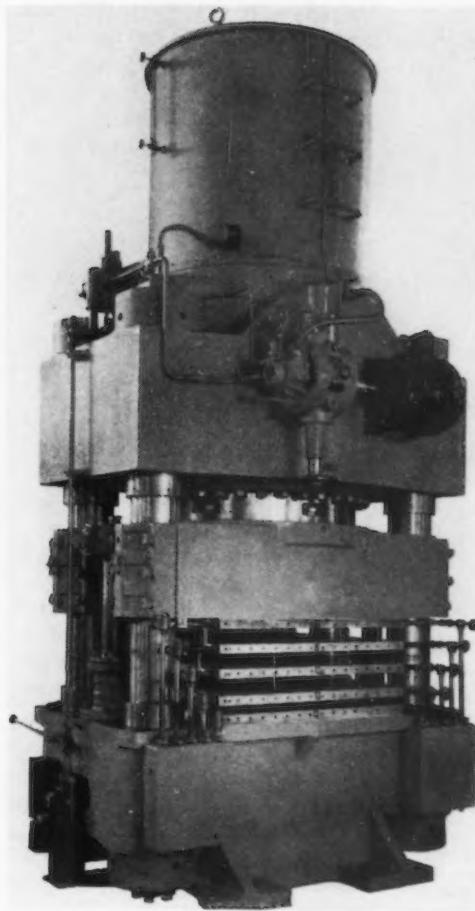
An automatic force feed system supplies all the main bearings. The clutch is the long hook, rolling key type with full length locking pawl and a releasing brake. Main and crankpin bearings are bronze bushed, while the driveshaft runs in Timken roller bearings. Bed, crown and the uprights are high test, pearlitic cast iron of



AT LEFT
SIDE lifting air cylinders with an independent equalizing mechanism for the head are featured in the new pneumatic drop hammer.

BELOW
WITH a multi-speed motor, strokes of 30, 45 and 60 per min. can be obtained on this Bliss 190-ton crank press with 36x60 in. bed.





ABOVE

HEAVER gages of non-ferrous metals and steel strip can be blanked, cupped and drawn in the Waterbury-Farrel crank eyelet machine. Size No. 200-A, with 11 plungers, is shown.

○ ○ ○

AT LEFT

ONE main ram and two auxiliary "Fastraverse" rams actuate this 1500-ton H-P-M hydraulic hot plate press for curing laminated materials by the application of heat and pressure.

suited for forcing, broaching, assembling, straightening and general manufacturing purposes.

General design followed throughout the series includes an all-steel welded frame with integral pump and motor base, ring type pistons fitted in hat type steel cylinders, ground and polished ram guided in a long bronze liner, molded ram packing, direct reading pressure dial, and simple hydraulic connections through seamless steel tubing brazed to flanged and forged fittings.

Two sizes of type DH Oilgear variable displacement pumps are available for each size of press. One provides economical ram speeds for general manufacturing purposes and the other higher variable ram speeds. Ram speed is controlled by varying the pump displacement and no bypassing or reducing valves are employed. The power consumption is directly proportional to the output and the efficiency is therefore high. The type PEC sideplate presses have as optional equipment Oilgear type C constant displacement pumps, however, to provide constant speed down and double the speed on the return.

High-Speed Hydraulic Press

Especially suited for stamping and coining, a 300-ton high speed hydraulic press has been developed by the *Lake Eric Engineering Corp.*, Buffalo, for operating up to 20 strokes per min. at full tonnage. The maximum adjustable stroke is 12 in., and space between columns is 24 x 36 in. Precise control of power, speed and pressure has been engineered into the controls. A selector control permits

the operator to choose jog, single cycle or continuous operation. The pressure is adjustable up to the full capacity, and the dwell at the top of the stroke is also adjustable.

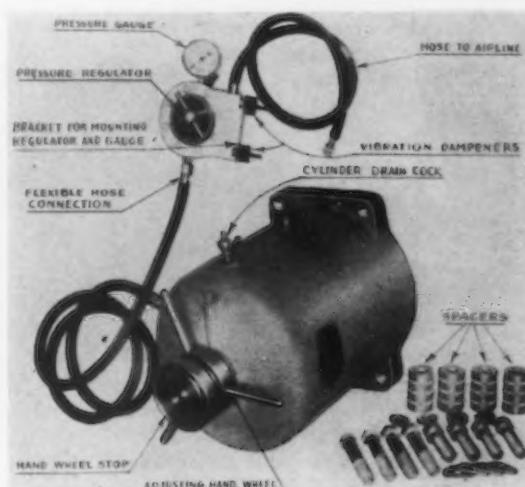
Hydraulic Hot-Plate Press

One of the most recent developments of the *Hydraulic Press Mfg. Co.*, Mt. Gilead, Ohio, is a Hydro-Power hot-plate press of 1500-ton capacity for compressing and curing thin materials,

○ ○ ○

THE Dayton-Rogers model A pneumatic die cushion is shown with all the necessary parts, including high-pressure flexible hose, for attachment to a punch press.

○ ○ ○





OILGEAR'S new 20-ton type PG gooseneck press, shown with working height platen, features sensitive control of the ram action.

high tensile strength and surface hardness. They are held together by steel tierods.

The more important dimensions are: crankshaft diameter at bearings $6\frac{1}{2}$ in.; stroke of slide 4 in.; shutheight on bed 24 in.; slide area F. to B. and R. to L. $20 \times 51\frac{1}{2}$ in. Conservative rating of the press for fine dies is 150 tons; ultimate capacity, 190 tons.

180-in. Toggle Press

Also illustrated is the latest design of a huge four-point toggle press built by the *E. W. Bliss Co.* plant at Toledo with 180 in. between uprights and 100 in. front to back. The bolster plate is 8 in. thick. It has two crankshafts running front to back, having a diameter of 12 in. at the bearings and 16 in. at the crankpins.

While this press was designed for drawing large auto-body panels and similar stampings, it can be quickly converted to single-action operation for blanking work. Furthermore, six hydro-pneumatic cushions in the bed, with a capacity of 200 tons, when used in conjunction with the double-action upper works, give in reality triple-action results. These cushions are fitted with locking devices to hold the pressure pads down until the

plunger has returned far enough to avoid distortion. The action may be timed to release the cushions at any portion of the up-stroke of the plunger, and separately in any order desired.

The frame is of tierod construction. Steel reduction gears give either $3\frac{1}{2}$ or 5 strokes per min., by means of a two-speed 25-hp. motor.

The clutch is a multiple disc, pneumatic friction type controlled by electric palm buttons, allowing the press to be inched for die setting. A central control panel is arranged to give several optional methods of operation. Farval lubrication system is used.

Plunger dimensions are as follows: Stroke 44 in.; shutheight, plunger to



ABOVE

OILGEAR side plate presses can be had with either a constant displacement pump, with constant ram speed down, or with a two-way variable displacement pump, with variable ram speed in either direction.

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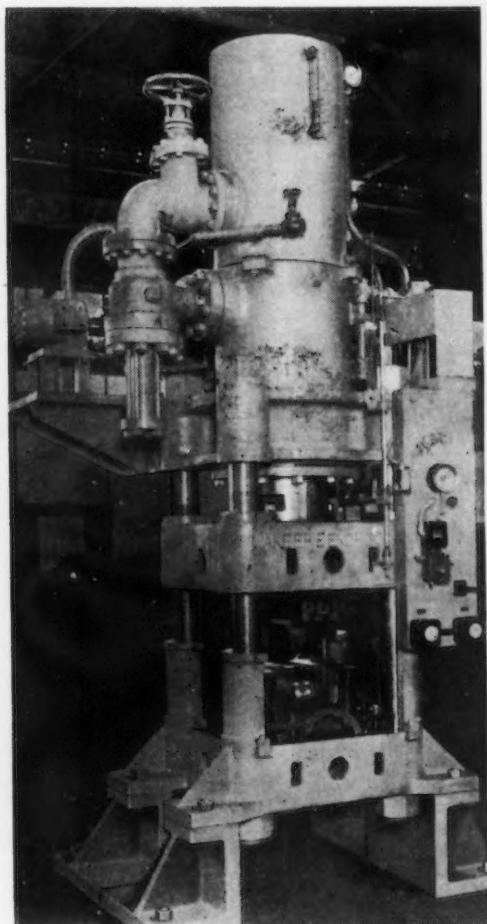
AT RIGHT

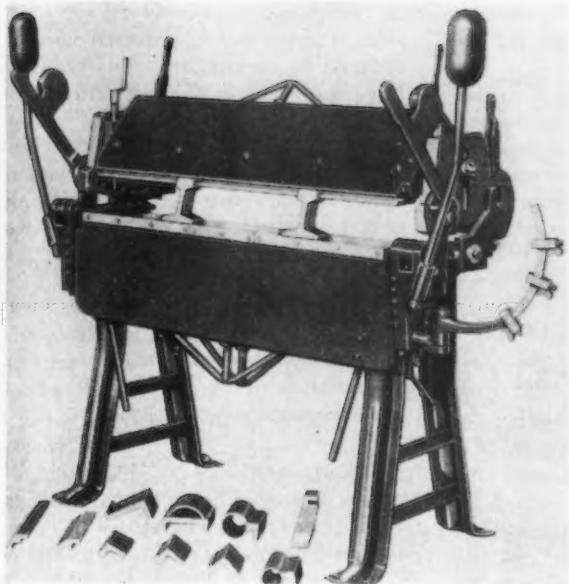
THIS Lake Erie 300-ton high-speed press can be operated up to 20 strokes per min. at full tonnage for stamping and coining operations.

bed 98 in.; adjustment 25 in.; area, F. to B., R. to L., 79×161 in. Blankholder dimensions are: Stroke 36 in.; shutheight, blankholder to bed 88 in.; adjustment 25 in. The long adjustments, which are of the rigidly supported barrel type, permit the use of either high or low dies as required.

Hydraulic Straightening Presses

The *Oilgear Co.*, Milwaukee, has brought out new lines of hydraulic gooseneck presses, straightening presses and sideplate presses, designed for modern needs and featuring variable ram speed, sensitive control, dependable performance, low power cost and low maintenance. Gooseneck presses are made in 6, 10, 15, 20 and 25-ton capacities, with high or low platens, spacer tables, work tables and straightening tables. The straightening presses proper are made in 25, 35, 50, 75, 100, 150 and 200-ton capacities, with long or short tables, spring centers, resistance block and sliding ram noses. Sideplate presses are made in 3, 6, 10 and 15-ton capacities, with detachable platens and variable or constant-displacement pumps of various sizes. The sensitive control makes these presses especially





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AT LEFT

PRACTICALLY all types of bends to be found in modern sheet metal work can be handled in the new Dreis & Krump universal hand bending brakes.

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The upper straightening rolls are individually adjustable or as a unit. By having power driven feeding rolls front and back of the straightening rolls and power driven lower straightening rolls, the material is easily and quickly started through this machine. The machine is capable of handling wide and comparatively heavy stock, and there is a coil holder attached for use with coils of a comparatively small diameter. To prevent kinking, an apron supports the stock into the pinch rolls. This machine is automatically controlled by a Mercoid switch so that if the press is stopped, the straightening machine will stop automatically.

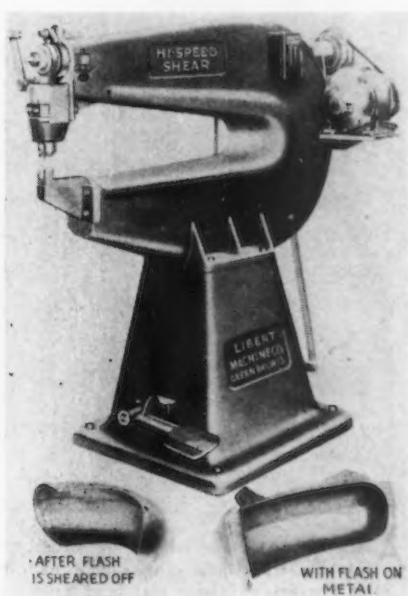
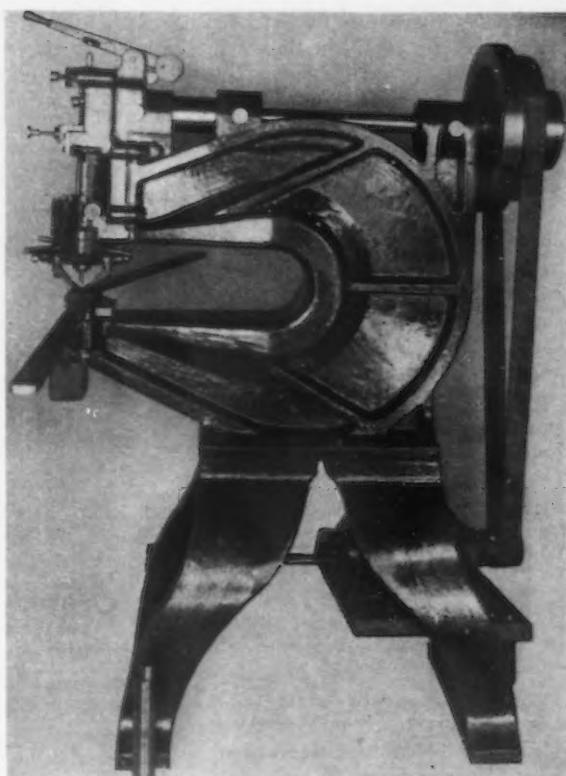
AT RIGHT

THE No. 4-A turret head metal cutter or nibbler with 24-in. throat and $\frac{3}{8}$ in. capacity has been added to the line of the Gray Machine Co., Philadelphia. The turret has twelve positions so that the stock need not be turned. The eccentric can be changed to accommodate a shearing attachment for stock up to $\frac{1}{8}$ in.

• • •

BELOW

MODEL 1036 high-speed shear, made by the Libert Machine Co., Green Bay, Wis., is arranged with a special lower cutting head to permit extreme flexibility in cutting formed sheet metal. It will cut on a formed radius as small as $\frac{1}{8}$ in. up to 90 deg., and is especially adapted to trimming the flash after the first draw on bulky stampings, like automobile fenders.



will notch 0.140 in. sheet and 3/16 in. strip.

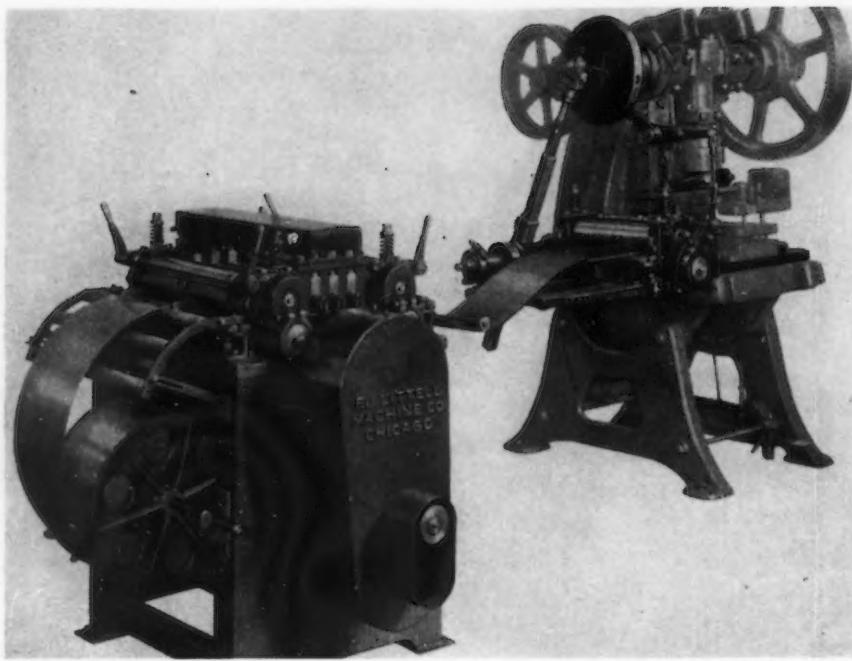
Variable Feed Straightener Feed

The F. J. Littell Machine Co., 4151 Ravenswood Avenue, Chicago, recently built a special power driven straightening machine with variable speed for straightening stock before being fed into a punch press. Some materials, such as soft aluminum, brass and copper, quickly take a set when the stock is run through the straightening rolls intermittently. Continuous straightening of the stock is secured on this machine by means of a variable speed drive.

The picture shows the material being fed into a press fitted with an intermittent cut-off die, which can be set to cut at any number of strokes. With a variation in length of feed, permitting the cutting of stock at any designated number of feeds, pieces from 1 to 10 ft. or longer, can be cut.

Side Trimming and Slitting Equipment

For speeding up the side trimming, slitting and processing of coil stock in the mill, warehouse or press shop, the Yoder Co., of Cleveland, is producing a line of equipment involving multiple-position drum stands. The uncoiling and recoiling reel stands are



CONTINUOUS straightening of non-ferrous stock is achieved by a variable-speed drive in the Littell power driven straightening machine.

such as paper stock impregnated with resin binder. This press is a vertical open rod type, with a closed top pedestal bed. The platen is actuated by one main ram and two auxiliary "Fastraverse" rams. This is an open circuit system with manual and automatically timed press travel control and a single-stage power unit.

Hydraulic power is supplied by a model 4R H-P-M high speed rotary pump of the radial plunger type direct connected to a motor. Timken roller bearings preserve the proper diametral clearance between the pintle and primary rotor, rather than depending upon the oil film.

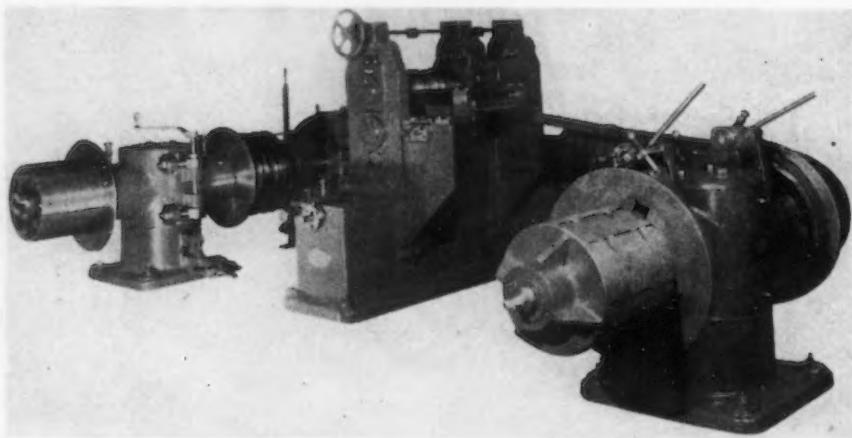
Pressing surface of the platen and bed is 48 x 48 in., and five hot plates

of the same dimensions by 2 in. thick are spaced between the platen and bed.

Crank Eyelet Machines

To supplement its line of cam eyelet machines (multiple-plunger blanking, cupping and drawing presses) extensively used for making light gage brass stampings from the strip, the *Waterbury Farrel Foundry & Machine Co.*, Waterbury, Conn., is now offering a series of crank eyelet machines to fabricate the heavier gages of non-ferrous metals as well as steel. The tooling is almost identical to that of the cam machine, but the power for performing the work is applied through cranks to a two-guided gate, or slide, which transmits pressure to

MULTIPLE-POSITION Yoder drum stands, providing clear stations for unloading stock reels, greatly speed up slitting and side trimming operations on coil stock.



the plungers straight down. There is no side thrust to cause wear. In this respect, the crank machine is more rugged and powerful than the cam machine. The top bearing of each plunger is provided with a heavy compensator spring for removing the shock load when starting. Numerous other features combine to make these machines capable of comparatively heavy forming and deep drawing.

These machines are built in three standard sizes. They are usually furnished with either seven, nine, or 11 plungers, a rear roll feed which pulls the metal through from a coil holder, and a finger motion in case a second or third row is to be cut from the coil. After the blank has been cut, it is automatically carried to the cupping station, which is provided with a blank-holder. The cup is knocked out of the die and lifted into a transfer slide and carried to the third and successive stations for the drawing and forming operations.

Specifications applying to the largest machine are as follows: Maximum width of metal, $3\frac{3}{8}$ in. (single row) and $7\frac{1}{4}$ in. (double row); maximum blank size 0.032 in. thick by $3\frac{3}{4}$ in. diameter, or 0.125 in. thick by 1 in. diameter; maximum depth in drawing dies, with standard $7\frac{1}{2}$ -in. stroke, $2\frac{1}{8}$ in.; normal speed for ordinary brass, 50 strokes per min.

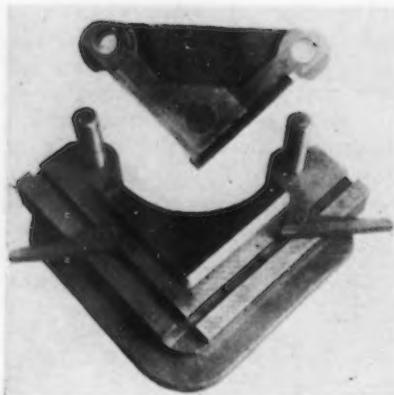
Pneumatic Die Cushion

A self-contained pneumatic die cushion adaptable for various drawing operations on punch presses and also useful for controlling pressure pads and stripping actions on compound blanking and piercing dies, has been placed on the market by the *Dayton Rogers Mfg. Co.*, Minneapolis. These cushions will operate on pressures from 15 to 160 lb. per sq. in., producing a drawing ring holding pressure from $\frac{1}{8}$ to 9 tons. Known as model A, this improved form is made in sizes from 4 to 16 in. piston diameter and in drawing capacities from $2\frac{1}{2}$ to $5\frac{1}{2}$ in.

Cylinder is made of an aluminum alloy for lightness. High pressure flexible hose fittings facilitate quick and easy installation. The pressure regulating equipment is mounted on one side of the press.

Corner Notching Dies

Service Machine Co., 754 Broadway, Elizabeth, N. J., is now furnishing a full line of corner notching dies for jobbing shops. They are designed for quick set-up and easy gaging, facili-



SEMCO utility corner-notching dies may be had in either 45 or 90-deg. included angle and with four lengths of blades from $2\frac{1}{4}$ to 10 in.

provided with two or more drums, so that while one set is in line with the processing equipment, such as slitters, the other drums are out of the way, where they can readily be loaded or unloaded without loss of processing time.

All of the drums are equipped with multiple drag brakes that allow the drums to pay off at the desired tension and at the same time prevent overruns when the processing train is suddenly stopped. During the processing, the indexing stands are securely held by a positioning block, which can be released by a treadle. For the recoiler, the driving mechanism is separate from the reel stand and is connected to the active drum by a jaw coupling.

The slitting and edge trimming mechanism, also new, is equipped with a combination entering guide, hold-down and wiper. The machine lends itself to many modifications. When it is set up for side trimming, housing mounted cutters may be used. When it is necessary to change quickly from side trimming to slitting, special adjustable cutters can be provided.

Universal Hand Brakes

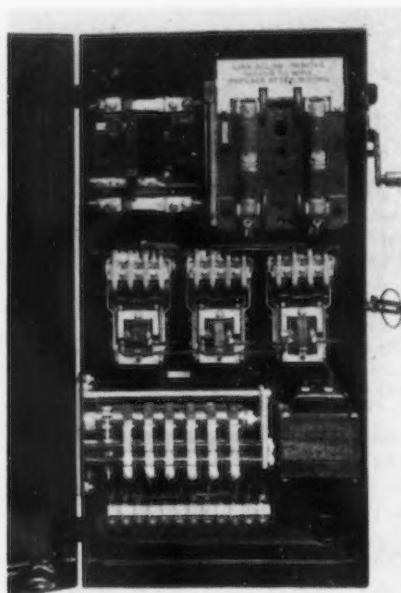
A new line of universal hand bending brakes have just been put on the market by the *Dreis & Krump Mfg. Co.*, 7430 S. Loomis Boulevard, Chicago, as a supplement to its regular line of steel hand brakes. The machines come in sizes 3 ft. $\frac{1}{2}$ in. long with 12-ga. capacity, to 10 ft. 1 in. long with 18-ga. capacity. They are capable of making all types of bends, including internal flanging, box work and round bends up to $3\frac{1}{2}$ in. radius.

By means of a screw and clamp, rapid up and down adjustment movement of the top jaw is provided for regulating the clamping pressure and to obtain clearance (up to $4\frac{1}{2}$ in.) for

crosswise boxes, pans and flanges. This adjustment also provides for the insertion of radius nose bars. For forward and back adjustment of the top jaw, an eccentric motion is employed. The inserted bottom jaw can be used in sections for work requiring flange clearance, and a sectional bending leaf permits bending on internal flanges or flanges on part of a sheet. For regulating the angle of bend, there is a swinging quadrant gage with multiple stops for repetitive work.

Punch Press Control Panel

Designed primarily to minimize the possibility of false operation, a new



PRACTICALLY foolproof. The G-E control panel for punch presses actuated by air clutches was developed primarily to minimize the possibility of false operation.

control system for punch presses actuated by air clutches has been designed by *General Electric Co.* A solenoid valve in the air clutch system is regulated by a magnetic control panel, modified by a four-position selector switch to give continuous operation, one complete short stroke, inching or jogging, and inching down on a long stroke and automatic completion of cycle. Incorporated in the system is a rotating cam-type limit switch with the contacts opened by a positive cam action in order to prevent the press continuing to run because of the failure of the contacts to open magnetically at the prescribed time. All push buttons, limit switches and contactor coils are connected in the secondary circuit of a specially designed control transformer, making it impossible for a ground at any point

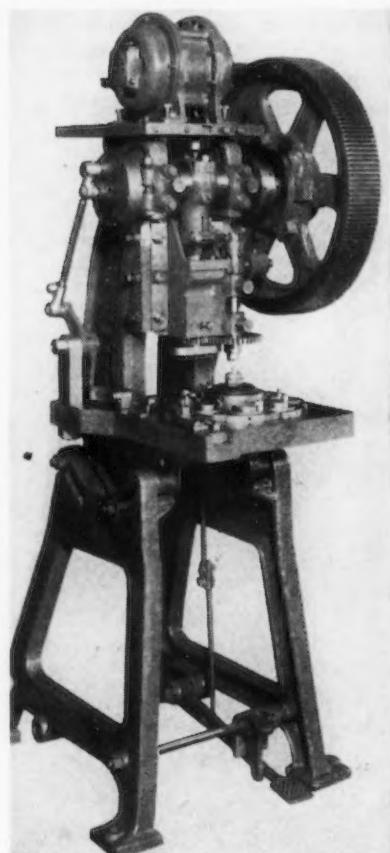
to energize the solenoid falsely. Besides, the number of external wires is reduced to a minimum, thus reducing the possibility of wiring failure.

Leader Pin Covers

The *Wiscman Mfg. Co.*, Dayton, Ohio, is marketing sets of leader pin covers in single top units or in two, three or four-piece telescoping units. The top units are used only when the opening between the pin and the bushing is to be covered. The telescoping units fully cover the leader pins in all positions of the punch slide. They come in various standard sizes.

Etching Press

A Toledo No. $3\frac{1}{4}$ open-back inclinable press with $1\frac{1}{2}$ in. stroke has been adapted by the *Toledo Machine & Tool Division* of the *E. W. Bliss Co.* for etching with acid the trade-mark and number on hardened steel parts. Attached to the slide is a rubber stamp die which is rotated 180 deg. every stroke of the press. The back stamp die comes down touching a pad of acid, then on the next stroke rotates to the front and applies it to the work which has been placed under the die by an eight-station dial feed.



A TRADE MARK and number is etched on steel parts with a rubber acid pad in this converted Toledo dial feed press.

TO THE EDITOR

Overdose Kills Golden Goose

By George A. Walker

THE President warns industry they kill the goose that lays the golden egg when they keep prices up at the expense of employment and purchasing power.

Industrialists kill the goose that lays the golden egg when they cut wages and thereby reduce purchasing power. Either policy is self-defeating and suicidal.

Does the President realize that Government control of crops has increased prices and so cut purchasing power? That excessive taxation to pay the farms for not raising crops has increased prices and so cut purchasing power?

That the Surplus Tax Law has strangled industrial expansion and replacement causing unemployment and so cut purchasing power? That the Surplus Tax Law prohibits building up inventories, thus causing idleness and so cuts purchasing power?

That our dollar now buys only 59 cents worth of labor products and so cuts purchasing power?

That the golden egg goose is dead. It died from an overdose of New Deal.

Industry will not commit suicide. It is dying from the same disease.

* * *

What Machinists Make Abroad

By O. R. F., Michigan

I AM especially desirous of obtaining the standard hourly wage rates for drill press operators, grinders, lathe-men and screw machine operators in Sweden, Germany, Belgium and Latvia.

Answer: Occupational classifications in Europe are not identical with ours. Machine tool operators are grouped under the classification "Fitters and Turners." Hourly rates are:

Sweden	35¢
Germany	32.80¢*
Belgium	21¢
Latvia	19.61¢

*Net rate. Wage tax of 13.5 per cent has been excluded.

Urges Publicity for Corporate Tax Burden

By A. D. W., Nutley, N. J.

DO you realize the tax load that it carries is one of the biggest hindrances to business and investment. If some of the corporations had sense they would publicize the terrific burden of taxes. Big salaries are taxed from 60 per cent to 40 per cent, and the net is only 40 per cent to 60 per cent. A. P. Sloan's taxes are about 60 per cent of his pay check. Same for Knudsen.

* * *

Finds Nourishment in Fruehauf Article

By F. M. Y., Wisconsin

DO you have extra copies of the Fruehauf labor relations article on pages 36 and 37 of the Feb. 24 issue? I would like to send a copy to each one of my employees.

This kind of article contains good food for thought for labor and industry.

* * *

"Hits the Nail on the Head"

By D. P. Forbes, President

Gunite Foundries Corp., Rockford, Ill.

I WISH to commend very highly the article by John H. Van Deventer, "If We Don't Hang Together, We Shall All Hang Separately," in your Jan. 27 issue. It certainly hits the nail on the head more accurately than any article I have had the privilege to read in a long time. I would like to get about six reprints.

New Zealand Steel Industry May Become State Monopoly

LONDON (By mail).—A bill providing for the establishment of an iron and steel industry as a State monopoly in New Zealand was read for the first time in the House of Representatives, Wellington, on March 4, and for the second time on March 8. It is proposed to finance the industry by authorizing the Reserve

Bank to invest a sum not exceeding £5,000,000 (\$25,000,000).

The control of the industry would be in the hands of three commissioners under the direction of the Minister of Industries, D. G. Sullivan. Mr. Sullivan said he expected the initial full production would be reached in two years, and this would amount to about 86,500 tons of finished steel annually.

This would still necessitate importing about 75,000 tons a year from Australia and Britain.

If the bill is passed, Brassert & Co. will be asked to supervise the technical operations until New Zealand has trained its own men.

TRADE NOTES

Fairbanks, Morse & Co. has announced the formal opening of its display room on the first floor of the modernized and renamed Fairbanks, Morse Building at 600 S. Michigan Avenue, Chicago. Dominating the exhibit is a 10-ton, eight-cylinder diesel engine for marine service. Grouped about this are electrical machinery, pumps, scales, railroad and farm equipment, household appliances, automatic coal burners and air conditioners—products that are manufactured in Fairbanks, Morse factories throughout the country.

Bradshaw & Co., 530 Fourth Avenue, Pittsburgh, have been appointed by Forty-Eight Insulations, Inc., as its representative in the Pittsburgh territory for Webers insulating cement, block, etc.

J. A. Fay & Egan Co., Cincinnati, maker of woodworking machinery, a West Virginia corporation, has been taken over by a new Ohio corporation bearing the same name. All operating assets of the old corporation were taken over by the new owners, according to Mark Hoeper, general manager.

Labour Co., Elkhart, Ind., is installing a small triplex type Lectromelt furnace of the top charge type. The construction of this unit will permit the use of three different shells. The furnace top is hydraulically raised and swung to one side for readily charging through the roof.

Ray-Ewbank Machinery Co., 101 Chandler Street, Montgomery, Ala., has been appointed distributor for county sales in the southern half of Alabama by Bucyrus-Erie Co., South Milwaukee, Wis. Company will handle the complete line of shovels, draglines, and cranes.

Allan, Knowles & Klaile, Inc., has opened a warehouse at 175 Vanderpool Street, Newark, N. J., where a stock of washers, plates, stainless steel and other materials will be carried in stock. Company will also engage in contract work in metal stampings. H. Knowles is president, William Klaile is secretary, and William Allan, vice-president.

Marley Co., manufacturer of cooling towers, Kansas City, has changed its location from 1915 Walnut Street, to 3001 Fairfax Road, that city.

R. S. Products Corp., Germantown Avenue at Wayne Junction, Philadelphia, has taken over the manufacturing and selling of the appliances for anti-friction bearing mountings that were originally introduced by the Bearing Appliance Co.

How Youngstown



FIG. 1—Picking up coil from conveyor at end of pickling operation.



FIG. 2—Delivering coil to temporary storage room.



FIG. 3—The same truck will tier the coils up to three high.



FIG. 4—Delivering coils from storage to the roller leveller.



FIG. 5—Weighing the coils on a platform scale.

THAT the electric industrial truck is rapidly assuming a role of major importance in the strip steel mill has been indicated from time to time in these columns. Several striking photographs were shown in the issue of Dec. 2, 1937 (Electric Ram-Trucks Speed up Strip Handling at New J. & L. Mill). A somewhat similar story, emphasizing other details, is presented here, showing the use of Yale electric ram trucks in the Indiana Harbor plant of Youngstown Sheet & Tube Co.

In this mill ram trucks are first used after the bar has been put through the hot strip mill and thence through the pickler, where the strip is coiled, wired, and delivered to a gravity roll conveyor section. At the end of this conveyor (Fig. 1) the truck picks up the coil and carries it to a temporary coil-storage room (Fig. 2). Sometimes, when floor space is at a premium, the coils are stacked in tiers, often three high (Fig. 3).

BELOW
AT LEFT

Sheet & Tube

Uses Trucks in Strip Handling

As further processing is required, the coils are removed by truck from the storage room and taken to the roller leveler, situated immediately in front of the four-high reversing mill seen at the left of Fig. 4. Notice that the ram truck picks up a coil from a three-high tier and deposits it in the roller leveler pit a few inches below floor level, with equal facility. In the reversing mill the strip is rolled back and forth until the required gage is obtained, then, at the discharge end of the mill the strip, recoiled, is picked up by the truck and taken to the scale (Fig. 5) for weighing. From the scale the coil is taken to the cleaning machine, the end of which is shown in Fig. 6. Here the strip is uncoiled, thoroughly cleaned of all foreign matter, recoiled and upended either by a stationary upender or an upending truck.

From this point the coils are placed on industrial railway cars which are hauled to the annealing room, where

the coils are put into the annealing ovens. After annealing the coils are again upended to a horizontal position and a ram truck comes into play once more to transfer them to the skin-pass, or temper mill. At the discharge end of this mill the coils are again picked up by ram truck and delivered to the flying shears, where the strip is cut up into sheets.

Two general types of operation follow. If the sheets are intended for tin plate, they are hauled to the picklers by Ross carriers, the sheets are pickled and then placed in water boshes. These boshes are hauled to the tin machine, and as the sheets come from the tinning process fork trucks pick them up and take them to the sorting room. After the plate has been sorted and counted, weighed and bundled, fork trucks haul the bundles to the warehouse and thence to freight cars or to highway trucks.

Other than tin plate sheets (as, for

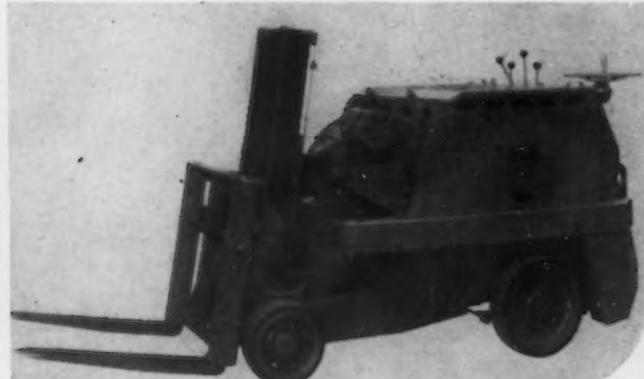
instance, automobile sheets) are handled from the flying shears by special conveyor lift trucks to the various succeeding operations and in most instances a 10-ton sheet loader is used for hauling them to the freight cars after they have been properly bundled.

The ram truck photographs here-with show one of two trucks furnished to the Indiana Harbor plant of Youngstown Sheet & Tube Co. by Yale & Towne Mfg. Co. Each truck has a maximum coil-load carrying capacity of 8000 lb., with a maximum lift of 84 inches. The maximum speed of the trucks fully loaded is 360 ft. per minute. Three other similar ram trucks, of 10,000-lb. capacity, are now being built by Yale for the same plant, one of which will be of the tilting mast type. It is interesting to note that all the later models of ram trucks being furnished for steel mill work are of the center control type, giving the operator a clear, unobstructed view of operations at all times.

FIG. 6—Delivering the coils to the cleaning machine.



FIG. 7—Tilting fork truck as used for tin plate handling.





A NEW type of small steel house has been built at Clairton, Pa., where a steel city will be built adjacent to the new Irvin works of Carnegie-Illinois Steel Corp.

INFORMATION on construction and materials used in industry's newest steel house was given out at Pittsburgh last week with the opening for public inspection of the Blaw-Knox Co.'s experimental home at Clairton, Pa.

The house is another move in what may result in creation of the world's first "town of steel," sheltering 4000 families expected to be located near Carnegie-Illinois Steel Corp.'s new \$70,000,000 Irvin works (recently Carnegie-Illinois granted an option to Gilbert & Varker, Inc., Philadelphia and Boston engineering firm, for land to be used as sites for from 300 to 500 steel homes).

At the opening Blaw-Knox officials said the structure's design was aimed toward development of a low cost

home without sacrifice of good materials and workmanship, proper insulation, comfort, attractive appearance and other factors essential for present-day dwellings.

Of Conventional Design

The house, of colonial design with a gabled roof, is 44 ft. 2 in. wide by 24 ft. 2 in. deep, containing approximately 900 sq. ft. exclusive of porches and is one of a large number of possible designs, since use of standard steel panels permits a wide range of planning for four, five, or six-room homes.

The unit now open to the public has a living room 17 ft. 9 in. by 13 ft. 1 in., a kitchen 14 ft. 5 in. by 10 ft., a utility room 8 ft. by 10 ft., a master bedroom 11 ft. 1 in. by 13 ft. 1 in., a

guest bedroom 10 ft. 6 in. by 10 ft., a bath 8 ft. by 6 ft., and a side porch 10 ft. by 7 ft., with a covered front entrance.

All steel fire safe construction, which is termite proof and provides a high degree of insulation as well as a low cost, has been employed. The house has been built on a foundation of concrete blocks resting on concrete footings carried below the frost line. The floor is laid on a reinforced four-inch concrete slab using 2 in. by 4 in. wood sleepers spaced 16 in. on centers. With the exception of the utility room, which has a concrete floor troweled smooth and level with the other floors, all are of yellow pine, sanded, stained, and varnished; the floors of the kitchen and bath are covered with standard linoleum.

Walls Prefabricated

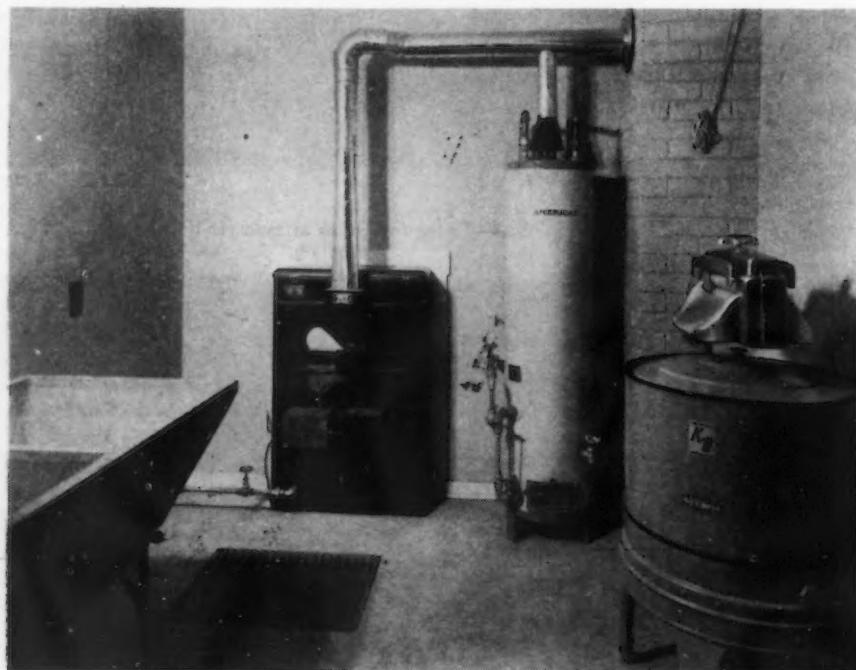
An outstanding feature of the Blaw-Knox home is in the exterior walls which are constructed of standard size insulated panels of wall height. These are made in prefabricated units either 40 in. or 20 in. wide, so that complete flexibility of design within the limits of the employment of these units is possible.

The panels consist of a steel frame of rust-resisting copper-bearing steel channels welded together. The interior and exterior surfaces of the panels are then covered with metal clad, 1-in. water-proof rigid insulation, thus forming an inclosed 3-in. air space. The panel is then completed with copper-bearing formed steel sheets laminated to the insulation with a rust-inhibitive asphalt emulsion cement.

Special Connectors Used

The fabricated panels are delivered ready for erection, with a shop coat of metal priming paint, and provide a smooth finish for both interior and exterior walls without the use of exposed bolts, welding, or screws.

THE utility room is equipped with modern appurtenances, all made of steel.



Details On Latest Steel

House Revealed At

Blaw-Knox Opening

No cutting is required to form windows or doorways, as all panels are fabricated to the exact size required and can be quickly erected with special connectors furnished.

The walls rest on a foundation sill or base angle of copper-bearing galvanized steel, which is attached to the foundation with $\frac{3}{8}$ in. by 6 in. bolts. A $\frac{1}{8}$ in. asphalt felt weather strip is cemented to the under side of the base angle to form a seal next to the foundation. The wall panels are securely bolted to the base angle and to a wall cap. Special wedge shaped brackets and stud connectors hold the panels securely in place.

All the interior partitions are constructed of channel studs placed 16 in. on centers with channel wall caps and floor plates; both faces of the partitions are covered with $\frac{3}{8}$ -in. sheet rock, using reinforced metal "A" joint system and crack filler.

Roof Framing Welded

The roof framing consists of double steel channels welded together. The truss members are bolted together, cross braced, and bolted to the heavy gage top plates of the side walls. They are designed to carry maximum loads on clear spans of 24 ft.

The bottom cores of the trusses provide the support for the metal clad insulated ceiling panels which are attached with clip brackets and Helyx nails.

All roof surfaces are completely insulated with one-inch asphalt impregnated rigid structural insulation attached to roof, trusses, and cross bracing.

The roof covering is of galvanized standard seamed panels. Special design of the ridge, ridge cap, and panel caps, provides an absolutely watertight roof.

Standard steel ventilated type casement sash with wood trim is used for all windows. Interior and exterior doors are of wood with wood frames and trim. Front and side porch materials are of steel with ornamental welded steel columns. Base interior ceiling cornice molds are of wood.

Code Requirements Met

The kitchen is supplied with a 52-in. single drain-board apron-type sink of porcelain enamel iron as well as with built-in cabinet and counter units which are completely assembled and factory enameled ready to set in place. The cabinets consist of one



A THOROUGHLY modern, all-steel kitchen contains units which are factory assembled, ready to be set in place.

wall unit 36 in. wide, as well as a 42-in. counter unit and a 36-in. counter unit.

The water, gas, and drainage systems are installed complete, according to code requirements. The plumbing is complete with a wall lavatory, five-foot bath tub, vitreous-china toilet, and two-section slate composition laundry tubs. The automatic gas water heater has an insulated storage tank. All fixtures are equipped with single chromium plated brass fittings.

Heat is provided by a gas fired heater and winter air-conditioner, giving a completely automatic warm air circulating system that heats, filters, humidifies, and purifies the air.

Wiring is complete in flexible conduit for fixtures, switches, base plugs, and utility outlets. The electric fix-

tures are of modern colonial pattern with the owner permitted to make his own selection within the allowance included in the contract price.

The design of wall and roof construction has been conducted to give a maximum of insulation to provide homes warm and easy to heat in winter and cool and comfortable in the summer. With a double thickness of 1-in. rigid structural insulation board, separated by an air space on the outside walls and one-inch insulation on both ceilings and roofs, an insulation rating of about 0.10 is attained compared to a conventional frame or brick veneer construction of about 0.25. The heat loss of ordinary construction is about $2\frac{1}{2}$ times as much as in a Blaw-Knox home of steel construction.

FABRICATED panels are delivered ready for erection.



Granite City's

New Strip Welder

A DESIRABLE practice is to butt weld several coils from a continuous hot strip mill prior to cold rolling. In this way a cold mill can handle longer lengths in a shorter time and with less wastage. A new type of strip welder, incorporating mechanical handling and shearing of the strip and automatic control of welding heads, was recently installed in the continuous strip-sheet mill plant of Granite City Steel Co., Granite City, Ill., by United Engineering & Foundry Co., Pittsburgh.

A conspicuous new feature of this welder is the use of the Linde automatic gas head for welding. Gas welding, manually controlled, for several years has been used by a large western steel producer for strip welding, but the efficiency of this installation probably will be greatly increased by Linde's new automatic control. Except for the new welding head, the Granite City unit is similar to that installed for Ford Motor Co. several years ago; that is, the shear is retractable, and the complete unit is mounted in a recoiling line.

The recoiling and welding machine at Granite City is placed in the line of production between the rotary pickler and 48-in. reversing cold mill; the oiled coils pass from the pickler to the uncoiler-leveler, thence to the welding unit.

As a coil passes through the welding machine, the front end is cropped, after which the entire coil is fed through the back tension rolls and on to the mandrel of a recoiler which draws the entire coil through the machine until the trailing end comes under a hydraulically operated clamp, which holds the strip while the end is cropped. The leading end of a second

coil enters the machine, thence under the shear, the clamps are set, and this leading end is cropped and matched.

The shear is the open throat upcut type and is retractable. After the two strip ends are sheared and matched, the shear unit moves back away from its position, at the same time pulling the welding head into place.

The two coil ends are held by the hydraulic clamp to prevent misalignment prior to or during the welding operation. Note also that the shear-

welding head is skewed three degrees from the right angle position with reference to the movement of the strip; thus the weld head passes between the work rolls of the cold mill progressively, thus minimizing shock.

The movement of the shear out and the automatic gas welder into the line to weld the sheared ends is activated by motor operated traverse gears, and, with the welder in position, another set of clamps engage the two coil ends about 10 in. from the weld line.

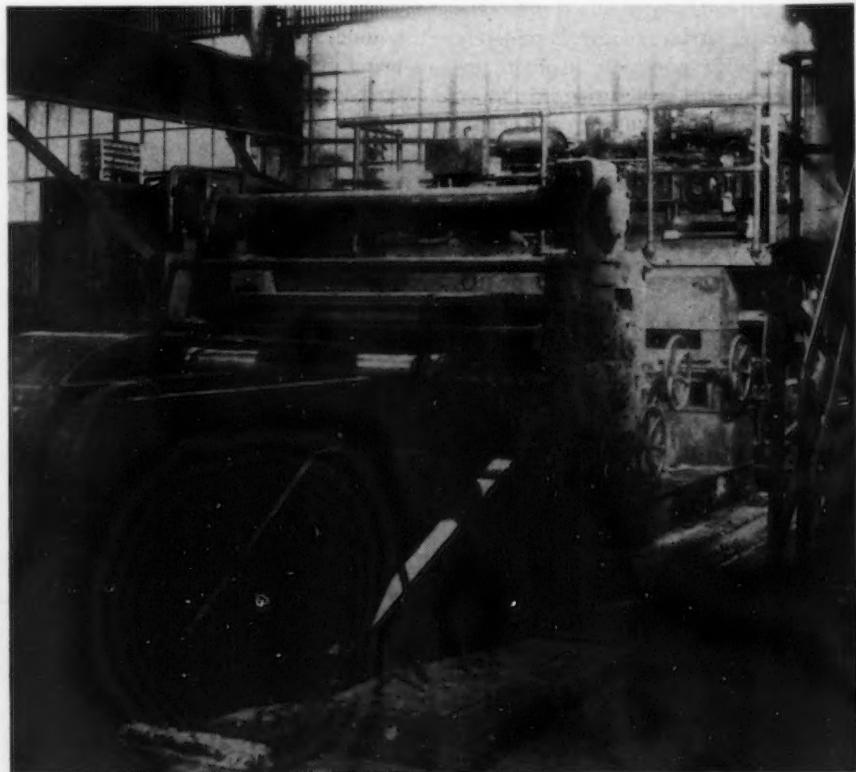
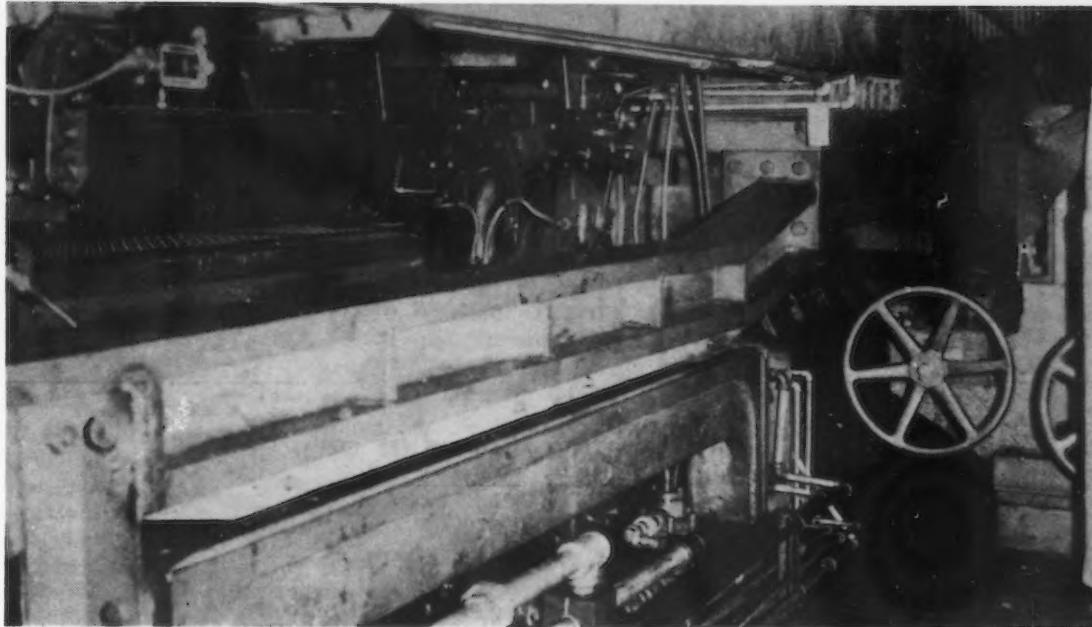


FIG. 1—Coil box and uncoiler-leveler at entry end of the 84-in. recoiling and welding line.

grees with the mill knock. and line saturated and, other coil line.

FIG. 2—When the two strip ends are sheared and matched, the automatic gas welding head shown here moves into place to butt weld the strip into one continuous assembly.



Multiple tip oxy-acetylene blow pipes, the welding heat automatically controlled by a photo-electric cell to give the correct penetration from top to bottom of the strip, joins the two strip ends.

With the weld completed, the top and bottom heads automatically separate and the traverse weld is run into side clippers. Here unmatched ends, as for instance when two strip widths are joined, are clipped out in

a quarter-moon pair of dies, after which the joined coils are run on through the back tension rolls and onto the recoiler mandrel.

Where three or more coils are to be welded together, the operation of the shear-welder is simply repeated once again.

This highly efficient machine has the following characteristics: (1) Reliability of welds, as proved by thousands going through the cold mill

without breaking; (2) no marking of work rolls; for there is no hard metal in or adjacent to the weld; (3) there is no necessity for flash stripping or grinding of the weld; and (4) the welding speed is suitable for operation in a recoiling or processing line.

Electrodepositing Tungsten Metal

A NEW process for combining tungsten by electrodeposition with other metals is described in a booklet just issued by the Tungsten Electrodeposit Corp., Washington. The process is said to be susceptible to close control and deposits ranging from 1 to 80 per cent are obtainable. Standard nickel electroplating equipment, such as is used for hot nickel plating, is readily adaptable to this process, and it is claimed that any competent electroplater can operate the tungsten electrolytic bath. The components of the dry concentrates required for the bath have been developed in cooperation with the Graselli Chemical Laboratories.

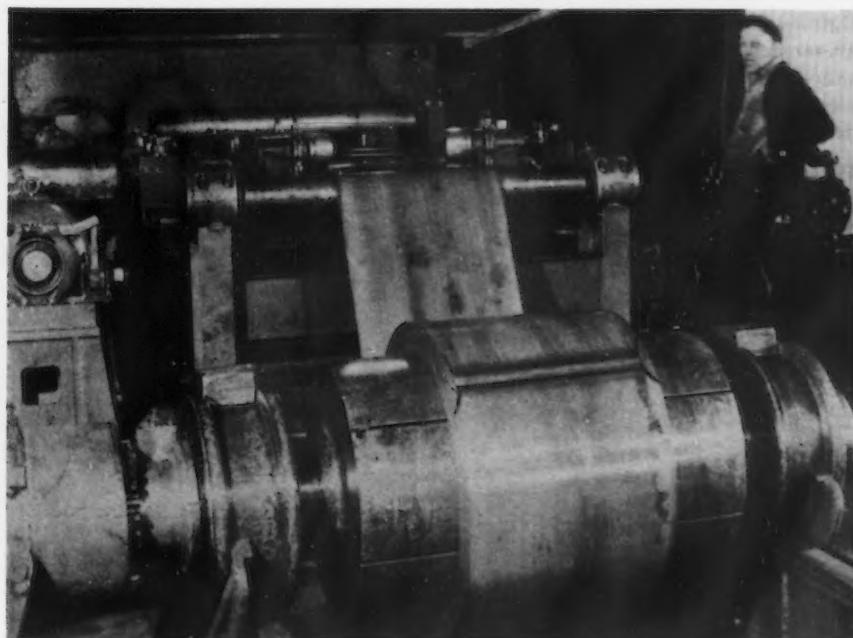


FIG. 3—After welding, the entire coil (two hot coils) is rewound on this mandrel, after which the strip is passed through a 48-in. reversing cold mill. Note the side clipped traverse weld in the foreground.

Monarch Steel Co., Indianapolis, Ind., producer of cold drawn steels and shafting and three special steels, manufactured under a process on which patents are pending, has completed negotiations with the Fitzsimons Co., Youngstown, also manufacturer of cold drawn steels, whereby the latter company will sell Monarch special steels as a licensee. The special grades include Monarch's special low carbon, free machining, case hardening steel, known as Speed Case X-1515, and Speed Treat X-1535, and their Speed Treat X-1545.

... . . . THIS WEEK ON THE

... Expansion in allied industries to benefit auto manufacturing.

• • •

... Minor changes expected to be followed by car price reductions in April.

• • •

... Moderate production gains indicated during forthcoming weeks.

• • •

... Design activity at five-year peak as important changes are put through.

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DETROIT.—Two important industrial expansion programs of interest to the automobile industry were announced last week in Detroit. City Pattern Works, Inc., is preparing plans to quadruple its floor space and will shortly erect a new pattern and machine shop, a non-ferrous foundry and a separate office building in the vicinity of the Chrysler Highland Park plant, augmenting its facilities for tooling up the automobile industry. Carboloy Co., Inc., will centralize all its manufacturing facilities in a new plant at Detroit. Three new buildings will cost approximately \$500,000 and will accommodate facilities now operating at Cleveland, Stamford, Conn., and Detroit. The new plant will be in the industrial area recently opened up on Eight Mile Road and Mound Road, north of Detroit.

To Reduce Production Costs

The second step necessary before reduced car prices go into effect this spring is now being taken. Two of the large manufacturers will begin production next week on "stripped" lines that will bring manufacturing costs down considerably. Bodies will be made as plain as possible, with trim, accessories and probably upholstery changed to afford cost reductions. Se-

lection of colors probably will be limited, and such extras as stippling of garnish moldings and window frames will be eliminated in favor of plain finish. One of these manufacturers already has a 10 per cent salary cut in effect, the other has reduced office personnel nearly 20 per cent in numbers. With lower cost materials available and inventories near bottom, these companies are well prepared to announce substantial price reductions, probably early in April.

Willys Announces New Low-Price Car

Making its bid for spring business with a new low priced car Willys-Overland is announcing on March 23 a two-door sedan priced \$95 lower than any other two-door on the market. It will be called the Willys Clipper family sedan. Delivery price at Toledo is \$549. The introduction of this new model confirms numerous rumors which have been prevalent in the automobile industry for several weeks.

Active production started a short time ago when Willys recalled 2000 additional men to the factory payroll. An indication of the sales efforts to be expended on the new car is the recent selection of a new vice-president, William C. Cowling, who for the past 23 years has been identified with the Ford Motor Co., for six and one-half

years of that time as general sales manager.

Most of the automotive organizations have made serious attempts to reduce the number of non-productive employees on the payroll. Briggs last week laid off 20 per cent of its non-productive help with the statement that it was hoped the condition would prove only temporary. When the order went down the line about 250 men were affected.

Only Slight Gain in Output

Production of automobiles did little more than hold its own last week, with 57,555 units turned out compared with 57,438 the previous week, according to Ward's Automotive Reports. Production a year ago was 98,978, with strikes the principal factor in this low figure. Ford increased production to 12,000 units, a gain of 500, with resumption of activities at some of the branch plants, and also built 560 cars at the Lincoln-Zephyr plant. Plymouth maintained output at 6000 units and Chevrolet again produced 17,000 cars. General Motors production as a whole was almost twice as great as Chrysler's, 23,860 to 12,975. Willys, steadily increasing production for several weeks, turned out 850 cars last week.

Until the middle of last week, greater gains in the production figures were expected but Buick unexpectedly shut down after three days' production. Resumption on a four-day schedule at this plant may be expected within a week, however. The step backward was merely an attempt to adjust output to new car sales volume which had sagged a little during the used car sales campaign.

The stage is being set for a substantial advance, although no major upswing is anticipated. The normal seasonal trend, plus the impetus furnished by the success of the National Used Car Exchange Week and the anticipated price reductions should make April, May and June good months for the automobile industry. F. R. Valpey, vice-president and general sales manager of Graham Paige Motors Corp., declares that a study of past performance in the automobile

ASSEMBLY LINE . . .

By W. F. SHERMAN
Detroit Editor

industry in good times and bad has convinced him that a pickup in business is inevitable.

"Disregarding 1929 and 1930 as unusual years, the records still show that 30 to 40 per cent of the annual sales in automobiles are registered in the second quarter of the year, whether the country is enjoying prosperity or fighting against a depression. And the dollar volume of business which the automobile industry has done in these three months each year runs into impressive totals. In 1931, for instance, more than \$450,000,000 was spent for automobiles in April, May and June; in 1932, during the worst of the depression, this amount was sharply reduced, but even so, the country found more than \$257,000,000 to spend for new cars; in 1936, the second quarter showed an expenditure of \$669,587,352, or 32 per cent of all the money spent all year for new cars in that year. With a case history like this as a guide," Mr. Valpey said, "there is no excuse for being caught off base with an inadequate supply of cars." This is why the industry as a whole is all set to increase volume very soon.

Packard Motor Car Co.'s vice-president and general manager, M. M. Gilman, reports the success of this independent unit during National Used Car Exchange Week:

"Our latest summary shows that

Packard dealers and distributors totaled nearly twice the volume of used car business during National Used Car Exchange Week as was done in the previous seven-day period."

Another independent unit, Studebaker Corp., reports through Vice-President George D. Keller: "Incomplete returns indicate that our dealers sold approximately 60 per cent as many cars during National Used Car Exchange Week as in the entire month of February."

New Studebaker Model

Studebaker has just announced a new sport model with two spare tires and extra wheels in fender wells on each side of the car. Suppliers are watching this reversal of the trend which only a few years ago made all the manufacturers put the spare wheel and tire inside of the car out of sight. If the demand for luggage space forces designers to go back to former methods of carrying the spare, it will result again in the manufacturing of tire carrier brackets and tire covers.

Coincident with the announcement that Roy Evans, formerly with Chevrolet and Dodge, is new assistant general sales manager, the Federal Motor Truck Co. has added 14 new models to its line of trucks, ranging from two- to eight-ton capacity, with both conventional and cab-over-engine design.

All of these will be six-wheel models.

On the other end of the truck scale, the American Bantam Car Co. has announced a pick-up commercial car with an all-steel body. It has a capacity of 500 lb., with a pay load space of 36 in. long and 47 in. wide. The body will be manufactured in the Butler, Pa., plant.

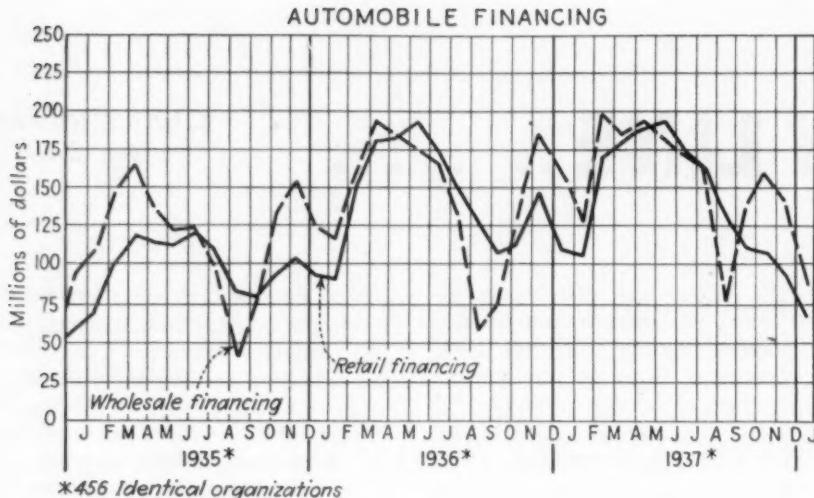
Michigan's industrial plants employed less help during February than in January, but industrial payroll reports to the State Department of Labor and Industry remain unchanged. Employment was 2 per cent under the previous month and 32 per cent under February, 1937. In automotive plants, however, changes both in employment and payrolls were recorded, the number of employees going down 0.2 per cent and the payrolls increasing 0.1 per cent.

Design Activity Increases

There is more design activity at the present time in the automotive industry than at any time in the last five years. The automobile has undergone relatively little change since late 1934, when the 1935 models were introduced. Basically, the cars have remained unaltered in most cases. Those who are in touch with advance practice, however, know that numerous changes are in the wind. Automobile engines, frames and bodies are due to undergo



THE tide turned by sale of more than 175,000 used cars during National Used Car Exchange Week. Scenes such as this are being re-enacted in the major motor car plants as the automobile industry prepares for a spring upturn in business. Buick, which so far has reported a successful year, is producing 800 cars a day from its final assembly line, and operations have been increased recently from three to four days a week.



some important revamping. In many cases these changes will affect next year's models.

Horsepower will cost less and will weigh less, although a major change in this item probably is still a few years off. A hint of engine design trends came last week when the Society of Automotive Engineers held a discussion of conventional design and of radical engine types now on the

test stand. C. V. Crockett, Cadillac Motor Car Co., discussed the Cadillac V-16 engine, which is new with the current model. Compactness and light weight are its features. Through careful engineering control, both size and weight were kept at very low figures and fuel consumption was increased above a comparable eight-cylinder engine with greater piston displacement per mile of vehicle travel.

Another designer, K. L. Herrmann, a consulting engineer who has worked with Studebaker, the old Briscoe Co., and the Bantam Ball Bearing Co., found many automobile engine designers in complete agreement with him when he declared that present arrangement of the cylinders in gasoline engines, and the numerous parts required in them, made it imperative to produce new designs if the progress of general automobile design is to be speeded up. For rear engine cars in particular, it has long been known that greatly reduced weight and compactness are essential. It would be impossible to put most of the present types of engines in the back of the car between the rear wheels, one important reason being that the weight distribution on front and rear wheels would be entirely unsatisfactory.

The engine he described was a type with the cylinders arranged around a horizontal shaft like a revolver barrel. Weight of this engine, he said, is something between one-fourth and one-eighth the weight of the comparable in-line V-engine.

More pertinent to the designs currently on drawing boards is the information supplied by Graham-Paige on its new ultra-modern looking car. During the cold snaps which iced the pavements in March, some of the new models, being driven away from the factory by dealers, met with accidents. From statistics on similar accidents which occurred with old models, it was apparent that 1938 cars involved in collisions suffered fewer and less expensive damages than the previous model. Practically every front-end accident to 1937 models required repairs of grille which cost between \$18 and \$25. In the 1938 model the entire grille can be replaced for \$14, but since the grille is made in sections, only damaged sections need be replaced. Positioning of the head lamps lower than in 1937 cars prevented damage from the platforms of trucks and other projections which do most of the damage to front ends of automobiles. This naturally reduced repair cost.

Repair Costs Reduced

Tricks of design kept the replacement cost of the massive 1938 fenders at the same level as last year's fenders, while the new headlamp embedded in the fender costs \$2.50 less than in the previous model. Tubular construction of the front cross member of the frame is credited with having reduced damage considerably because of the greater strength built into the cross

(CONTINUED ON PAGE 82)

OUT OUR WAY

BY J. R. WILLIAMS



Capital Goods Activity Shows No Definite Improvement



THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

	Week Ended Feb. 19	Week Ended Feb. 12	Comparable Week
		1937	1929
Steel ingot production	40.8	37.8	114.8
Automobile production	52.9	54.5	91.1
Construction contracts	73.4	72.7	66.7
Forest products carloadings	50.2	49.2	70.6
Production and shipments, Pittsburgh District	52.5	52.9	110.6
Combined index	54.0	53.4	90.8
			124.9

AS yet there are no definite indications of an upward trend in the activity of the capital goods industries. Although there has been moderate increases in the week-to-week physical volume of the output of the industries represented by THE IRON AGE seasonally adjusted index, these gains have in most cases been barely sufficient to compensate for seasonal trends. In some instances, notably steel production and automobile assemblies, the gains have been substantially less than the customary seasonal movement. A reflection of this condition is found in the comparatively unchanged position of THE IRON AGE capital goods index for the week of March 19. The index number for this week is 54.0, as compared with 53.4 in the preceding week. Heavy engineering awards for the week were \$53,284,000, a decline of \$27,240,000 from the

abnormally high figure of the previous week, but \$17,684,000 above a comparable week in 1937. The volume of public construction awards for the week reached the highest point since the week ended July 23, 1936, due largely to school and institutional programs in various states, according to *Engineering News-Record*. After remaining stationary for three weeks at 30 per cent of capacity, the ingot rate advanced two points for the week, causing the index position of the steel production series to be advanced 3.0 points. Automobile production for the week was 57,555 units, as against 57,438 in the previous week and 98,978 a year ago. Failure to make the gains indicated by the seasonal trend caused this series to recede 1.6 points to 52.9 per cent of the base average.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

THIS WEEK IN WASHINGTON

... Belief Administration plans broad-scale slashing of tariff rates keeps many witnesses from testifying before trade agreement committee.

• • •

... European competition seen as factor disturbing American industry only if powers call halt in race to build up armaments.

• • •

... Labor Board concedes Fansteel employees were sit-down strikers and damaged mill equipment but orders management to reinstate them.

• • •

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

• • •

WASHINGTON.—Not a single major iron or steel product was the subject of hearings before the Division on Metals and Manufactures of the Committee for Reciprocity Information in connection with the proposed trade agreement with the United Kingdom. Originally the committee had listed 90 witnesses to appear before this division, more appearances than had been

scheduled for any other group. As it turned out only about 25 witnesses testified in connection with the metal schedule. The big day was to have been March 17. The hearing on that day fizzled out in about one hour. The brief hearings on the metal schedule were also characteristic of hearings before the other three divisions which had been set up prepared to listen to some 400 witnesses. The actual number who testified shrank much below that number, to perhaps not more than 200.

Wholesale withdrawal of appearances was attributed in part to the apparent view of prospective witnesses that their evidence would not be given its deserved consideration. On the other hand, some appearances had been listed when it was the purpose of protestants against reduction in American tariff duties to rely entirely on briefs they filed with the committee.

This was true of the American Iron and Steel Institute, which, in behalf of the iron and steel industry, had submitted a brief urging that iron and steel rates be not reduced.

Hearings before the Metals Division chiefly concerned anti-friction bearings, and raw materials, such as manganese, fluorspar, tungsten and lead and zinc ores. The Metals Division consists of H. Lawrence Groves, chairman, Department of Commerce; Granville Woodard, Department of State; J. I. Dugan, Department of Treasury; Edward A. Foley, Department of Agriculture, and Loyle A. Morrison, Tariff Commission.

Opposes Tariff Reduction on Anti-friction Bearings

W. E. Umstattd, president of the Timken Roller Bearing Co., told the division that any reduction of duty on balls and rollers under a trade agreement with the United Kingdom would result in the importation of "vast quantities" of anti-friction bearings.

He named Italy, France, Germany, Sweden and England as possessing the modern plant facilities to flood the American market in the event the armament race is brought to a close.

Because of the most-favored-nation clause "we feel that countries other than England will benefit to a great extent from a reduction of the duty rate on balls and rollers," Mr. Umstattd testified. He recognized that the proposed trade agreement listed anti-friction balls and rollers as the only subjects in his line to be considered in making tariff concessions but explained that American manufacturers fear this step constitutes "an entering wedge" for including the inner and outer races, which after assembling, make up the completed bearing.

Mr. Umstattd said that wages in the

... FOR
Lower
TOOL COSTS

CONTINENTAL

Interchangeable Counterbores
... WITH THE INDESTRUCTIBLE DRIVE

Operators can push Continental Counterbores into the work with perfect assurance that the drive will not break or stick. The driving lugs are under compression, and are not subject to shearing action; for this reason they do not break off. The cutter can be easily detached by hand, no matter how tough the operation.

Not only is the drive indestructible, it is balanced. Two equal and opposed lugs integral with the cutter shank mate with two lugs formed in the body of the holder. Aligning bearings, one above and one below the drive, prevent runout. No pins or other loose pieces are needed.

The Continental Drive has been successfully applied not only to a complete line of standard holders and cutters, but to special tools as well. A number of these, including form and form-relieved cutters, inserted blade cutters and combination tools, are illustrated in our catalog.



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anti-friction bearing industry are 85 per cent higher than in England and 123 per cent higher than in France; that American wages in the steel industry are 121 per cent higher than in England, 176 per cent higher than in Sweden, and 156 per cent higher than in Germany. Steel for rollers, he said, can be purchased in England at a price 29 per cent lower than in this country.

In explanation of his statement that

European competition will be a disturbing factor only if the armament race is halted, the witness pointed out that the productive capacity of European ball and roller bearing manufacturers will have been increased far in excess of the normal demand because of current war preparations. If and when such production highs trek downward European manufacturers will be forced to seek export outlets, he continued, and outside of Europe

the United States is the only market of consequence for these products.

Wants Ore Duties Retained

Robert S. Palmer, Denver, Secretary of the Colorado State Mining Association, urged retention of present duties on metallurgical fluorspar, tungsten, and lead and zinc ores.

In asking that the duty of \$8.40 a ton on fluorspar of less than 97 per cent calcium fluoride be left unchanged, Mr. Palmer said that foreign material has been reaching the eastern steel companies at delivered prices below the cost of shipping domestic fluorspar and that the recent freight rate increase handicapped American producers still further. Chief countries of importations were said to be Russia, United Kingdom and France.

Since the Sino-Japanese conflict, resulting in curtailment of imports from China, the price of tungsten has been increased and enabled domestic interests profitably to produce tungsten for steel users, Mr. Palmer said. He declared, however, that continuance of the existing duty of 60c. a lb. of contained tungsten and 50 per cent *ad valorem* is necessary to protect the domestic industry. He likewise contended that there should be no reduction in duties on lead and zinc ores.

Urge Domestic Manganese Protection

J. Carson Adkerson, president of the American Manganese Producers Association, asked that the present rate of duty on manganese ores and its alloys not be frozen under the proposed trade agreement with the United Kingdom. The manganese ore duty was reduced 50 per cent to $\frac{1}{2}$ c. per lb. of manganese content under the Brazilian trade agreement. Domestic producers want the original duty of 1c. restored following six months notice to Brazil.

"It has been definitely established that the United States has an abundance of low-grade manganese ores and processes through which satisfactory high grade manganese ores may be recovered from these low-grade deposits," Adkerson said.

As new processes of outstanding importance, he mentioned the new improved Leute process applicable to the ores of South Dakota, electrolytic

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Here, an Erie Steam Drop Hammer is forging anchor chain links of 4-inch cross section...doing a most unusual job...Two parts are forged into one link by closing one half around the other...Just one of the hundreds of tough jobs Erie Steam Drop Hammers are doing every day in industry throughout the world...500 forge shop men will appreciate copies of a new bulletin on Erie Steam Drop Hammers soon to be released...It proves the value of Erie's 35 years experience in hammer building which is at your disposal...Reserve your copy early.

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process of the United States Bureau of Mines and the new du Pont process.

"Although a Government owned stockpile will help," he said, "it still will not assure the country adequate security as no one can foretell how long an emergency may last."

"It must be clearly understood that unless the industry is stabilized by adequate tariff protection, a temporary increase in price will not warrant new investment of capital in the industry and substantial increases in production cannot be expected."

"It is most essential at all times to maintain a healthy nucleus of a manganese industry with the United States ready for expanded production to meet the needs in an emergency. This can best be done through the means of an adequate tariff."

"But this is not all. A stockpile means an expenditure by the Government. Tariff means revenue to the Government while the domestic mines are being developed."

Zinc Institute Opposes Reduction

Convinced of serious and widespread consequences if contemplated concessions in the present tariff rates for imported zinc ore, slab zinc, zinc oxide, and zinc dust are made as the result of reciprocal trade treaties, now being negotiated by the State Department with Canada and the United Kingdom, the American Zinc Institute, representing 95 per cent of the United States zinc industry, filed statements with the Committee for Reciprocity Information requesting the continuance of the present zinc import duties and pointing out the likely effects should any concessions be granted.

Among the probable consequences of the zinc tariff concessions being considered by the Government of this country, according to the institute, are:

(1) Shut downs of many American zinc mines and smelting properties, and resultant labor layoffs and curtailed payrolls;

(2) Sacrifice and the possible permanent loss of vital markets for an American zinc and lead industry upon which 100,000 persons are directly dependent;

(3) Encouragement of an already large and growing flow of foreign zinc into the United States at a time when domestic production is twice the consumption, and zinc prices are depressed far out of proportion to the recession of general commodity prices;

(4) Impairment of domestic emergency sources for one of the most important national defense materials;

(5) Automatic lowering of the existing tariff on zinc from Mexico, Belgium, Poland, France, Norway, Australia, and the Netherlands—in addition to Canada and the United Kingdom—that is, countries with very cheap labor, large ore reserves, or facilities for cheap transportation, and

(6) Reduction of the tariff protec-

tion of the American zinc industry to a point well below that level termed "reasonable" by the National Resources Board in 1935.

The negotiations with Canada involve the present duty of 1½c. per lb. on zinc ore and 1¼c. per lb. on slab zinc and zinc dust. The discussions with the United Kingdom threaten the current tariff protection of 1¾c. per lb. on zinc oxide and leaded zinc oxides in dry form and 2¼c. per lb. when mixed with oil or water.

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Government Expert Sees No Reason For Export Embargo on Scrap

TAKING the position that exports of iron and steel scrap from the United States, though in large amount last year, are relatively unimportant from the standpoint of conservation of resources, E. W. Pehrson, assistant chief of the

Metal Economics Division of the United States Bureau of Mines, told the National Association of Waste Material Dealers at the Hotel Astor, New York, on March 15 that an embargo on such exports from the United States can hardly be justified



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either on the basis of conservation or national defense.

Calling attention to the growth in our scrap exports from 228,000 gross tons in 1932 to more than 4,000,000 tons in 1937, Mr. Pehrson said that "prolonged exports of this magnitude obviously would deplete the reservoir of scrap available in this country and hasten the exhaustion of our deposits of iron ore. It appears, however, that the present exaggerated demand for steel in foreign countries is temporary and will hardly endure for more than a few years. As a matter of fact, some of the principal foreign consumers of scrap already have taken steps to make themselves less dependent on distant supplies of iron."

Scrap Reserves Large

Commenting further on the export situation in scrap and its possible effect on our own national economy, Mr. Pehrson said:

"The reservoir of iron in use in this country, from which our annual scrap supply is withdrawn, is enormous. Estimates have placed the amount at 750,000,000 to 1,000,000,000 gross tons. We have no data on the rate at which this metal becomes available as scrap, but it is significant to note that the peak exports of 1937 amounted to only one-half of 1 per cent of the total reserves of potential scrap. Moreover, the amount of metal added to the reservoir in that year was considerably more than that withdrawn. It may be conservatively estimated that in 1937, 35,000,000 tons of iron and steel products were added to the store of metal in use, whereas the total scrap withdrawn for domestic consumption and for export probably did not exceed 25,000,000 tons. Thus, in the year of unprecedented scrap exports our reservoir of potential scrap was actually increased by 10,000,000 tons. It may be concluded, therefore, that to date the quantity of metal shipped abroad has not caused a serious drain on our total scrap supply.

"In comparison with our reserves of iron ore, scrap exports likewise do not appear to present a problem of great import. It has been estimated that our total reserves of ore amount to 4,400,000,000 tons, seemingly ample for expected needs for generations. The scrap exported in 1937 was equivalent to approximately 8,000,000 tons of iron ore, an insignificant part of our total reserve. It amounted to less than two months' ore supply at the average rate of production in 1937.

"Higher prices, resulting in part

from the export trade, have made possible the reclamation of large tonnages of material that under ordinary circumstances would have been dissipated as rust. A substantial part of the material exported has been of inferior grade, unsuited to the needs of domestic consumers, and probably never would have been reclaimed for domestic use at any price. To these ends, at least, exports actually have served the interests of conservation.

Says Conservation Would Apply To Pig Iron and Steel

"Careful consideration of all factors leads to the conclusion that the conservation that would be achieved by the imposition of an embargo at this time is too small to justify such action. It should be remembered also that the anti-conservational aspects of the export trade in iron and steel scrap apply equally well to the export trade in pig iron and iron and steel products. If embargoes are to be placed upon exports of scrap they should also be placed against exports of other steel products as well as exports of all mineral commodities of domestic origin, if a consistent policy of conservation is to be pursued."

National Defense Aspects

"Since steel is the backbone of modern warfare and since scrap is an essential raw material in its manufacture the effect of scrap exports on national defense should be considered carefully. The problem assumes two aspects:

1. To what extent have these shipments weakened our own military strength, and
2. To what extent have they strengthened a possible adversary?

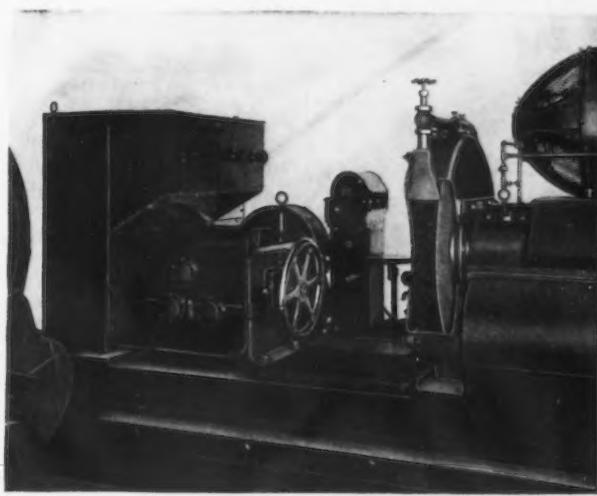
"It has been shown that the annual exports to date have reduced our total reserves of iron ore and scrap only by a trivial amount. It can be assumed, therefore, that our supply of raw material for steel manufacture has not been impaired seriously. It may be argued, however, that our supply of readily available scrap has been depleted in recent years to such an extent that in a sudden emergency, when large tonnages would be required to meet a rapid increase in demand for steel, the necessary supply would not be forthcoming. Unfortunately there are no specific data on this point, but it is believed that reserves available at prices prevailing a few months ago were far from exhausted and that a moderately higher price would bring additional enor-

mous tonnages of metal onto the market. The fact that the domestic steel industry operated at 90 per cent of capacity during part of 1937, when exports were at record levels, seems to indicate that the industry was still able to meet sharp advances in demand.

"One beneficial result of the recent export trade from the viewpoint of national defense is the increased efficiency of our mechanism for collecting and sorting scrap. Thus if an

emergency should develop in the near future the prompt collection of large tonnages could proceed without delay.

"Consider now the influence of these scrap exports on the military strength of the foreign countries to which they are sent. Two of the largest importers, Japan and Italy, are notoriously deficient in raw materials for steel manufacture. Their steel industry, therefore, is quite dependent on imports of scrap obtained principally from the United States. If exports



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drive known for machine tool carriages. The gears are mounted in anti-friction bearings.

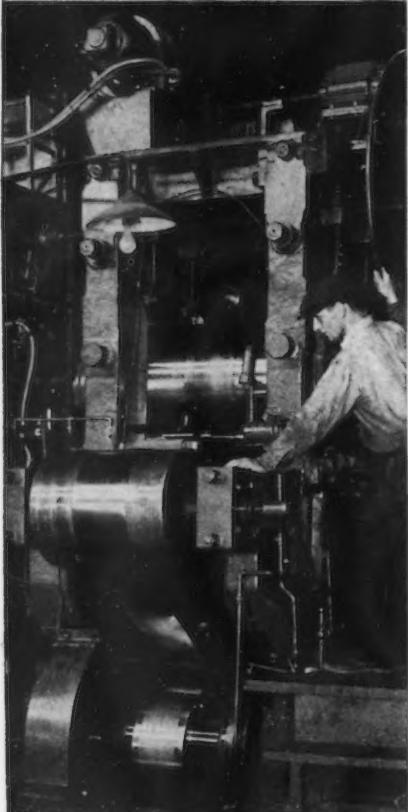
Reversal of the carriage traverse is accomplished electrically, eliminating mechanical reversing clutches. A variable speed motor and a two-speed drive provide a wide, variable speed range for every grinding condition. Speed change and point of reversal of the carriage are automatic and require no further attention on the part of the operator. Oil bath lubrication is provided for the gears and bearings of the carriage drive and for the worm meshing with the rack on the bed.

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were curtailed at this time, these countries would be forced immediately to make their industries independent of the United States. Under present conditions, however, the United States occupies the strategic position of being able to cripple their steel production, at least temporarily, by suddenly cutting off the supply of scrap if unfortunate circumstances would require such action. This may be illustrated by citing figures for Japan. In 1937 she produced roughly 5,300,000 tons of steel. In the manufacture of this tonnage, over 2,000,000 tons of scrap were used of which the United States supplied 1,900,000 tons. Thus one-third of the raw material used in Japan's steel industry in 1937 was derived from American scrap. It can readily be seen that sudden stoppage of this flow would adversely affect Japan's ability to produce steel.

Japan Importing Iron Ore

Recognizing their vulnerable position, these nations are attempting to improve their condition and are succeeding to a surprising extent. Japan is importing increasing amounts of iron ore from nearby Asiatic areas. Undeveloped reserves in the Philippines are sufficient to supply the Japanese steel requirements for generations. Japan is the logical economic market for these ores, and considerable tonnages already have been shipped and negotiations are now under way to greatly increase this trade. Japan is also increasing its capacity for producing pig iron, and as its steel industry attains larger volume, the supply of scrap at home will increase. Eventually Japan will be entirely independent of American supplies. Italy likewise is becoming less dependent on foreign raw materials through improvements in technology and a broad self-sufficiency program.

"It seems to me that an embargo on scrap exports at this time would force foreign countries to seek their supply of raw materials elsewhere, thus terminating a valuable strategic position now occupied by the United States.

"I shall not attempt to discuss the effects of the heavy exports and higher prices on domestic consumers of scrap or to consider whether the free market of one part of the iron and steel industry should be restricted for the benefit of another part. These are questions that require very careful study. But I do wish to emphasize that, except in unusual circumstances, an embargo on exports of a raw material of which there is an abundant domestic supply can hardly be justified on the basis of conservation or national defense."

At the closing session of the association the following day, the board of directors adopted a resolution holding that, except under war conditions, the government has no right to take any embargo action on scrap iron, since 15,000 firms depend upon these materials and the open market for them in Europe.

Joseph Schapiro, of S. Schapiro & Co., Baltimore, was re-elected president of the national association, and Charles M. Haskins was also re-elected secretary and treasurer and managing director of the association. Along with eight others Mr. Haskins was honored at the annual banquet for having been present at the organization meeting of the association 25 years ago.

Bill to Regulate Sizes of Tin Cans May Be Defeated

WASHINGTON.—Passage of the bill of Representative Sauvethoff of Wisconsin to regulate the dimensions of milk cans and cans for packing of fruits and vegetables appeared to be improbable following hearings Tuesday and Wednesday of last week on the measure before the House Committee on Coinage, Weights and Measures.

Not only did a majority of the committee itself indicate opposition to the bill but it was also attacked by large canning interests and can manufacturers. These included H. T. Austern, National Canners' Association; Dr. W. W. Harrison, Continental Can Co.; Frank R. Rice, secretary, Evaporated Milk Association, Chicago; Walter Page, Evaporated Milk Association; Dr. F. F. Fitzgerald, American Can Co.; Gladden Searle, vice-president, Continental Can Co., and Ralph H. Frank, National Can Co. Appearing in support of the bill were George Warner of the Commission of Weights and Measures, Wisconsin Bureau of Agriculture; Math Koenigs, Badger State Restaurant Association; D. E. Montgomery, Consumers' Council and others.

The bill would standardize the cans affected, reducing the milk can sizes to three and the vegetable and fruit can sizes to seven, ranging from 1/32 to 1-gal. As a result the number of sizes of tin plate needed by can makers would be reduced to 12.

Opposing makers contended that it would cost in the neighborhood of \$50,000,000 to change their production lines to meet the requirements of the

bill and that the proposed standardization would freeze the sizes and make it impossible to extend efforts in finding ways to can new products. They pointed out that efforts made by the National Canners Association in co-operation with the Division of Simplification, Bureau of Standards, to standardize can sizes and in the case of staple goods had reduced the number of can sizes from 64 to 21. A number of tin plate manufacturers were present at the hearing and are interested in the bill because the proposed changes in can sizes would affect rolling operations.

Proponents of the bill said that a number of foods have come into the market recently in odd sized cans which are misleading as to their quantity. This point was met with the declaration that such practices will be minimized by further voluntary simplification of sizes through the Bureau of Standards.

FTC Given Power To Protect Consumer

WASHINGTON.—Passage by Congress of the Lea-FTC bill broadening the commission's power to cover deceptive as well as unfair trade practices brings to the agency that which it has been seeking for years—power to become a consumer watchdog with a full set of teeth.

Marking the first time that the Federal Trade Commission Act has been amended, the new legislation empowers the commission to issue a cease and desist order if it is determined that the public is harmed irrespective of whether a competitor is suffering. Heretofore the agency has found it impossible to move against a company unless a complaint was received from a competitor.

An accompanying committee report described the new legislation as making "the consumer of equal concern" along with the merchant or manufacturer injured through unfair or dishonest competition. The commission is also expected to be able to speed up its procedure although at the same time its activities presumably will reach a new high.

Adding teeth to the FTC enforcement machinery, a cease and desist order now becomes final and enforceable 60 days after issuance unless, of course, the respondent goes to court. For each violation of a commission order after becoming final the recalcitrant can be fined up to \$5,000.

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tion that gets things right. Hit-or-miss methods are not tolerated at B-G-R. We prefer the modern way—which gives you the advantages of up-to-date methods and materials—and springs of proven value. *Have your next orders for springs, wire forms and small stampings filled by B-G-R.*

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Restrained From Selling Old Bearings As New

WASHINGTON.—The Federal Trade Commission has announced that Harold Benedict Co., Inc., of Highland Park, Detroit, has entered into a stipulation to discontinue advertising and selling used bearings without first disclosing that such products are used, old, worn or second-hand.

The FTC said that "a substantial

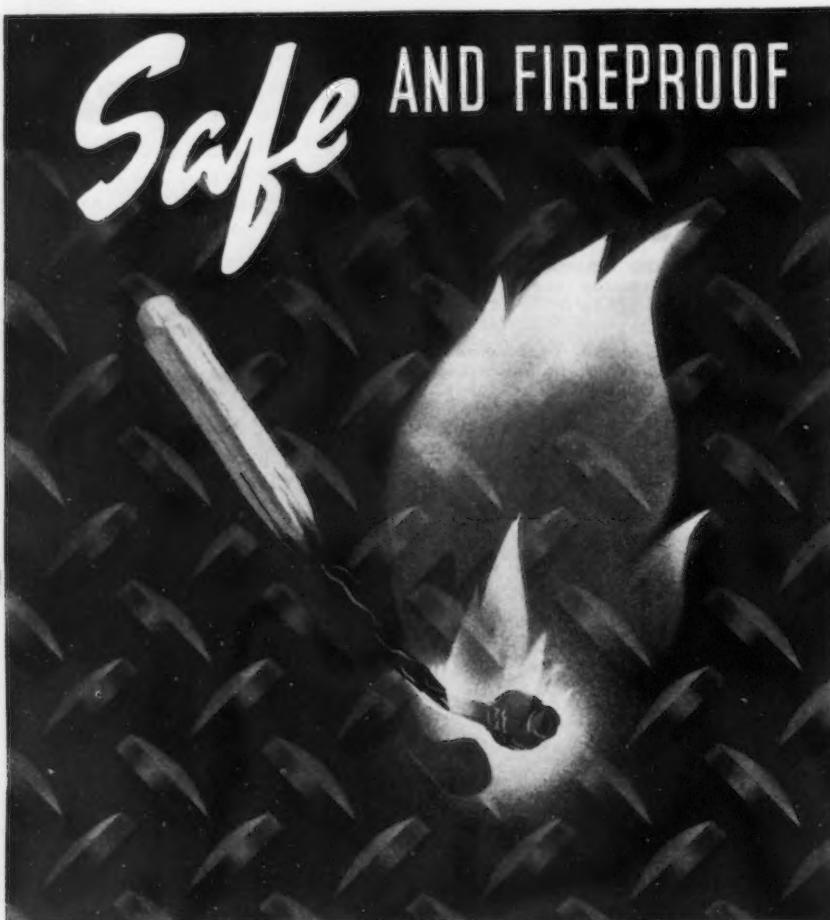
proportion" of the company's products—ball bearings—were salvaged from automobile junkers and wrecking companies, were later reconditioned and then sold without being designated as used or second-hand.

Trade Practice Rules for Carbon Dioxide Makers

WASHINGTON.—The FTC has promulgated trade practice rules for the carbon dioxide manufac-

turing industry. When produced for sale as liquid carbon dioxide, it is stored, sold and distributed under pressure in steel cylinders which, when empty, are returned by the consumer of the product to the producer or distributor for refilling.

Manufacturers, members of the industry, sell and distribute such carbon dioxide products throughout various parts of the country to wholesale and retail dealers, bottlers, ice cream manufacturers, beverage dispensers, and others. Total invested capital of the manufacturers approximates \$25,000,000, and their annual sales volume is estimated at \$10,000,000.



Fires don't start or spread on Inland 4-Way Floor Plate. It's easy to keep clean. Its curved projections form no pockets to collect dirt or grease. It drains quickly, provides equally safe traction in all directions and makes an attractive floor pattern.

Prevent slipping and falling accidents in your plant and avoid frequent floor repair costs. Inland 4-Way Floor Plate carries the load safely year after year. Order it from your distributor, or write today for the Inland 16-page illustrated Floor Plate Book which shows a variety of typical installations.

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SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

COMING CONVENTIONS

March 21 to 25—Western Metal Exposition and Congress, Pan-Pacific Auditorium, Los Angeles, sponsored by the American Society for Metals and 17 other technical societies. Information may be secured from W. H. Elsenman, secretary, A.S.M., 7016 Euclid Avenue, Cleveland.

March 25—Gray Iron Founders' Society, Inc., Hotel Statler, Buffalo. Details may be secured from W. W. Rose, executive vice-president, 1010 Public Square Building, Cleveland.

April 8—Management conference, under sponsorship of Society for the Advancement of Management, American Society of Mechanical Engineers, Iowa Manufacturers Association and University of Iowa. Meetings will be held at the University of Iowa, Iowa City, Iowa.

April 20 to 22—American Institute of Mining and Metallurgical Engineers, meeting of committee on blast furnace and raw materials, Statler Hotel, Buffalo. Committee chairman is R. H. Sweetser, 17 Battery Place, New York.

April 25 to 26—American Zinc Institute, Hotel Statler, St. Louis. E. V. Gent, 60 East 42nd Street, New York, is secretary. Meetings of the Galvanizers Committee will be held in conjunction with the institute's meetings.

April 25 to 27—American Gear Manufacturers Association, General Brock Hotel, Niagara Falls, Canada. J. C. McQuiston, secretary, Penn-Lincoln Hotel, Wilkinsburg, Pa.

May 3 to 4—American Steel Warehouse Association, Inc., Waldorf-Astoria Hotel, New York. W. S. Doxsey, 422 Terminal Tower, Cleveland, secretary.

May 14 to 19—American Foundrymen's Association, annual convention, Cleveland. Secretary, D. M. Avey, 222 W. Adams Street, Chicago.

May 26—American Iron and Steel Institute, Waldorf-Astoria Hotel, New York. Walter S. Tower, 350 Fifth Avenue, New York, executive-secretary.

June 12 to 17—Society of Automotive Engineers, Greenbrier Hotel, White Sulphur Springs, W. Va. John A. C. Warner, secretary and general manager, 29 West 39th Street, New York.

June 27 to July 21—Annual meeting American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, 260 South Broad Street, Philadelphia, secretary.

Labor Board Orders Workers Who Damaged Plant Rehired

WASHINGTON—The National Labor Relations Board was thrown for a loss last week in its battle in defense of the Wagner Act when it fumbled the ball and ruled that the Fansteel Metallurgical Corp., of Chicago, must reinstate 90 former employees, all of whom, the board conceded, were sit-down strikers.

It was reported to be the first NLRB decision involving the sit-down strike and although the board attempted to brush the delicate subject aside by denying it was passing on the legality of the sit-down, it was placed in the position of condemning an employer for alleged violations of the labor law and at the same time condoning the sit-downers.

In brief, the board overruled the company's contention that some participants in the strike of February, 1937, should be barred from reinstatement.

"Some of the missiles thrown by the men were intended for the purpose of breaking the windows, others were undeniably aimed at the attacking deputies," the board said in its decision in describing activities of the strikers. "While the equipment was damaged by this barrage, as well as by the deputies' bombs, there is no evidence that any malicious sabotage of equipment took place."

Attacks Company

In other words, the NLRB recognized damage resulting from acts of violence on the part of the strikers but cast this aside as an incidental factor since there was a lack of "malicious sabotage." Instead it centered its attack on the company which, it charged, engaged in "unlawful conduct" which led up to the strike in the first place.

In advancing the view that the sit-down strike should be a bar to reinstatement, the company "does not come before the board with clean hands," the board said.

"One who engages in persistent and open defiance of a national law cannot be heard to assert that the retaliatory conduct of his employees in seeking to secure their rights is necessarily a bar to their reinstatement. We have, in some cases, declined to order reinstatement of striking employees despite the fact that the strike

was caused by the employer's unfair labor practices."

The board then cited previous decisions in which it said that strikers had been refused reinstatement by the board's order because of "shooting, conspiring to destroy property and using dynamite" and added:

"It cannot be said that the conduct

of the strikers in the present case is analogous to the conduct in these instances. They were not engaged in sabotage...."

Observers are watching with interest for further developments in the event the case is taken to a higher court. Doubt has been expressed that the courts will uphold the board in ordering reinstatement of sit-downers found guilty of violating state laws, irrespective of whether or not they were, as the board puts it, engaged in "malicious sabotage."



... and no lost machine time. Slugs of semi-precious metal are delivered from a central control point by this automatic carrier. The skilled operator merely signals for metal and, when it arrives, unloads the carrier and returns it by push-button switch. Wise management gets full benefit from his skilled wage.

This is but one of the many systems

designed by American MonoRail engineers for eliminating needless handling costs. Both manual and power operated carriers show labor saving returns.

A copy of 24 page book describing the MonoTractor drive is available. Write to the American MonoRail Co., 13103 Athens Avenue, Cleveland, Ohio.



...OBITUARY...

WINTHROP C. NEILSON, a vice-president of the Aluminum Co. of America, died at his Ardmore, Pa., home on March 12, aged 60 years. He had held the position he occupied at the time of his death since 1931, but was concurrently president of the Republic Mining & Mfg. Co., a subsidiary of the Aluminum company. Born in Philadelphia, Mr. Neilson attended the University of Pennsylvania, from which he was graduated in 1899. He was a member of the American Institute of Mining and Metallurgical Engineers. Besides his activities in the Aluminum company and the Republic Mining & Mfg. Co., Mr. Neilson held offices and directorates in a number of other companies, such as the Clinton Mining Co., the Righter Coal & Coke Co., the Brookside-Pratt Mining Co., and the Keystone Drop Forge Works.

* * *

RALPH C. STIEFEL, formerly vice-president of the Aetna-Standard Engineering Co., Youngstown, and inventor of a disk piercing method of making seamless tubes, died in St. Petersburg, Fla., on March 15, aged 76 years.

Born in Zurich, Switzerland, Mr. Stiefel received his technical training in the Zurich Scientific School, from which he was graduated in 1881. After serving in Swiss silk spinning mills for a year, he became chief draftsman with French and Swiss establishments. He later went to Great Britain to work on seamless tube projects with the British Mannesmann Tube Co., Swansea, Wales. He came to the United States in 1894 and became general superintendent of the Ellwood Welded Tube Co., Ellwood City, Pa., later the Shelby Tube Co., now a part of the National Tube Co. He remained with the National Tube Co., of which he was superintendent from 1895 to 1912. In the fall of 1902 he was coorganizer of the Standard Engineering Co., which was merged in 1926 with the Aetna Foundry & Machine Co. to form the present Aetna-Standard Engineering Co. During his long career in the manufacture of seamless steel tubes, he was connected with the installation of the mills for Spang-Chalfant & Co., Jones & Laughlin Steel Corp., and National Tube Co. He retired as vice-president of the Aetna-Standard company in 1930.

* * *

HARRY WARREN BOULTON, industrial relations manager of the Murray Corp. of America, died March 15 at

Harper Hospital, Detroit. He had been ill eight months. Mr. Boulton had specialized in the training of youth for industry and had written a number of textbooks now in use in industrial apprentice training projects. Mr. Boulton joined the Murray corporation in 1933, but previous to that he was director of apprentice training with Warner & Swasey Co., Cleveland. In 1935 he served as chairman of the Detroit Manufacturers Committee on apprentice training. He was chairman of the automotive section of the National Safety Council, vice-chair-



W. C. NEILSON

man of the Board of the Detroit Industrial Safety Council, a member of the executive council of the Detroit Employment Managers Club. During the World War he was stationed at Dayton as a materials testing engineer with United States Air Service, having graduated from the Carnegie Institute of Technology. Mr. Boulton was born in England but he had lived in the United States since he was 16 years old. At the time of death, he was 42 years old.

* * *

WILLIAM L. CLOUSE, chief engineer and director of the National Machinery Co., Tiffin, Ohio, died March 15 of food poisoning in Biloxi, Miss., while on a trip. Mr. Clouse, who was 79, was widely known for his inventions on forging machinery. He was graduated from Denison University, Granville, Ohio, in 1878 and studied civil engineering at Ohio State University. After working for the Pennsylvania Railroad he went to Tiffin in

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1883 to work for the Anderson Machine Co., which later became the National Machinery Co. The company joined with him five years ago in celebrating his 50th year with the company.

❖ ❖ ❖

H. W. STEELE, president of the Shelby Spring Hinge Co., Shelby, Ohio, died March 14 in Shelby.

❖ ❖ ❖

DR. ERWIN R. STOEKLE, vice-president of the Globe-Union Co., Inc., Milwaukee, manufacturer of radio apparatus, storage batteries, etc., died at Boston, Mass., on March 14, following an operation. He was born in Chicago in 1891 and went to Milwaukee in 1914 to organize a research laboratory for Cutler-Hammer, Inc. In 1922 he founded the Central Radio Laboratories of Milwaukee, and upon its merger with the Globe-Union company in 1925 became vice-president of the parent firm.

❖ ❖ ❖

FREDERICK M. WARD, secretary and assistant treasurer of the Johnson Service Co., Milwaukee, and Johnson Temperature Regulation Co. of Canada, and a director of both firms, died on March 12, aged 57 years.

❖ ❖ ❖

LEE E. ALLEN, vice-president and chief engineer of the Pennsylvania Engineering Works, died March 9, at New Castle, Pa. He was 52 years old.

❖ ❖ ❖

THOMAS E. GERRIE, engineer with Packard Motor Car Co., died March 16 at Harper Hospital, Detroit. Born 39 years ago in Columbus, he went to Detroit 14 years ago, after living in Port Huron. He was a graduate of the University of Michigan in 1924.

❖ ❖ ❖

CHARLES S. BRONSON, who was identified with E. C. Atkins & Co., Indianapolis, Ind., in an executive capacity for 55 years, died at his home in Port Washington, N. Y., on March 2, aged 81 years.

❖ ❖ ❖

STAATS J. COTSWORTH, assistant manager of sales of the Philadelphia office of Carnegie-Illinois Steel Corp., died at his home at St. Davids, Pa., on March 18.

Mr. Cotsworth had had a lengthy service with the United States Steel Corp., and from 1912 until 1935 served as sales agent in Philadelphia for the Lorain Steel Co. On Oct. 1, 1935, when the Lorain Steel Co. was unified with Carnegie-Illinois Steel Corp., he was assigned to the duties of assistant manager of sales of that organization.

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...NEWS OF THE WEEK...

Labor-Management Symposium Slated For Washington In Fall

A SESSION of plain speaking on the present difficulties of business management—its troubles with Government, with labor and with general world confusion and uncertainty—is planned for the seventh International Management Congress, to be held in Washington, beginning Sept. 19.

Ralph E. Flanders, president Jones & Lamson Machine Co., and past president of the American Society of Mechanical Engineers, is to speak on "The Balancing of Incentive and Security." Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, will discuss the "Influence of Technical Progress upon Social Development."

There is to be a three-way symposium to seek "A Common Ground for Labor and Management," in which the participants are to be an internationally known labor union leader, a large employer, and a speaker on behalf of the public.

The congress also hopes to have two addresses on "The Continuance of Free Enterprise"; one by an outspoken American critic of Governmental interference with business, and one by a speaker from Czechoslovakia. At the same time, the program as so far arranged reveals that both Germany and Italy are sending substantial delegations, and have nominated speakers and topics which indicate that the case for "totalitarianism" or the "corporative state" is to have a franker and more complete presentation, by its chief proponents, than probably has ever before been heard by an American audience.

Among the topics to be discussed in the production and personnel sessions are: "The Reduction of Purchasing Risks"; "When is a Machine Old? When it is Worn Out, Obsolete or Written Off"; "Organization for the Control of Manufacture"; "A Review and Evaluation of Supervisory Training Experience"; "Accident

Prevention in American Industry"; "Principles and Methods of Wage and Salary Determination" and "Merits of Typical Wage Payment Plans in Providing Suitable Compensation and Incentive to Workers and in Measuring Manufacturing Efficiency".

Empire to Start New Sheet Mill in Few Days

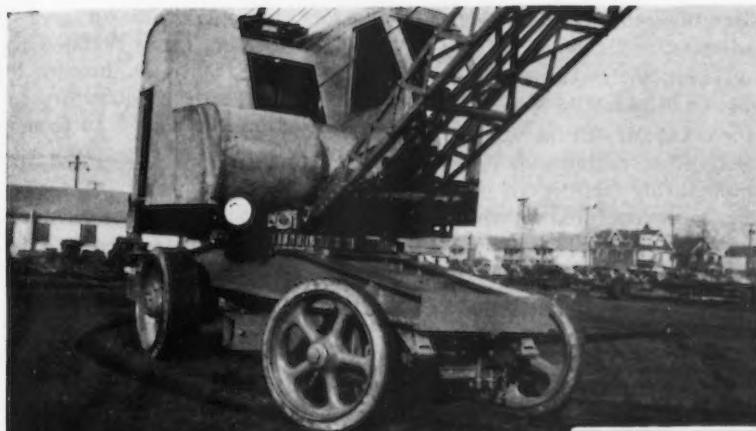
CLEVELAND.—James M. Hill, president Empire Sheet & Tin Plate Co., Mansfield, Ohio, has announced that operations will start within a few days at the company's new mechanized sheet mill built at a cost of \$250,000.

Pennsylvania 44-hr. Law Hit By Court

HARRISBURG, Pa.—Pennsylvania's 44-hr. work law, subject to considerable confusion and rulings since its passage, has been declared unconstitutional by the Dauphin County Court. The State is moving this week to take the question of constitutionality before the Pennsyl-

NEWS AND MARKET INDEX

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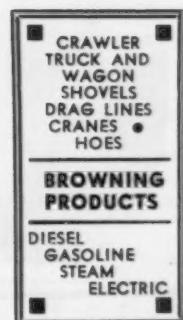
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vania Supreme Court which is meeting in Pittsburgh. The county court decision, however, did not affect a similar law passed last September applying to female workers.

Carboloy to Build New \$500,000 Plant in Detroit

A NEW factory and general office to cost approximately \$500,000 will be built by Carboloy Co., Inc.,

manufacturer of cemented carbide tools and dies.

The new plant, to be located on a 40-acre tract on Eight-Mile Road will be ready for occupancy in the fall. It is being designed to accommodate the entire manufacturing facilities of Carboloy plants now operated in three separate units at Cleveland, Stamford, Conn., and Detroit.

The structure will be in three units covering an area of 138,000 sq. ft. The manufacturing plant is to be a

one-story building with an area of about 100,000 sq. ft. A two-story structure of 18,000 sq. ft., housing the research laboratories and factory offices, will adjoin the plant. In front of these two units, a two-story office building is to be erected.

Armco to Spend \$300,000 on Its Zanesville Plant

MIDDLETOWN, OHIO.—Expenditure of \$300,000 for improvements in the plant of the Zanesville, Ohio, division of the American Rolling Mill Co. has been announced by Calvin Verity, executive vice-president. This is a step in carrying out an \$11,000,000 improvement program in all the company's plants, which was authorized by the stockholders in 1937. Some of the program has already been completed and much of the remainder is underway.

Plans at Zanesville call for the installation of two continuous furnaces, a new three-high mill, and the extension of an existing building to house the new mill. Work will be begun at once.

88 Top 25-yr. Mark At Reading Machine Plant

GOLD watches for 88 employees with a service record of 25 years or more were presented veterans of the Textile Machine Works, Reading, Pa., at a banquet given in their honor. Members of the firm, foremen, and all employees with 20 years of service, were present as the founders of the firm, Ferdinand Thun and Henry Janssen, made the presentations.

Dr. John E. Livingood, vice-president, said that 7.2 per cent of Textile's employees have a service record of 20 years or more against the average for similar groups in American industry of 4 per cent.

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When the Blueprint calls for PRECISION:



When the engineer or designer plans for precision strip steel, he wants uniform close accuracy to gauge over the complete width and length of the strip. Instead of specifying a special tolerance today, more and more manufacturers get just this quality at no extra cost by ordering "C.M.P. Accuracy."

Cold Rolled Precision Strip Steel produced on our 4-high single stand reversing mills is held to exceptionally close limits. You are assured of uniform production, coil after coil. It is continuously annealed in a single thickness in controlled atmosphere, assuring a bright, uniform anneal from edge to edge.

"C.M.P. Accuracy" applies to all grades of strip in carbon and stainless grades, in gauges as light as .001" and in coils as large as you can handle.

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Smith Steel Foundry Co., Milwaukee, has installed a one-ton Lectromelt furnace adapted for making alloy steel castings in addition to the company's regular line of heavier electric steel castings.

F. L. Jacobs Co., Detroit, automobile parts manufacturer, has acquired the W. I. T. Mfg. Corp., including its subsidiary, the Air-Track Mfg. Corp., College Park, Md.

Tool Equipment Sales Co., 24 South Pulaski Road, Chicago, has been appointed the exclusive agent for the Pines Winterfront Co., for Chicago and surrounding territory on small and large stampings and enameling.

Pittsburgh Mills See Low Shipments In Second Quarter

PITTSBURGH.—Iron and steel carloadings during the second quarter of 1938 for the territory covered by the Allegheny Regional Advisory Board are expected to reflect a 40 per cent decrease from the corresponding quarter in 1937.

In presenting the iron and steel committee report at the Advisory Board's regular meeting at Pittsburgh last week C. W. Gottschalk, assistant traffic manager of Jones & Laughlin Steel Corp., said: "Since reaffirmation of current steel prices for the second quarter, there has been a slight but noticeable improvement in inquiries and sales. However, whether uptrend in demand has definitely set in, remains uncertain. But there is reason to feel that the worst is past and that from now on conditions will gradually improve. Many of the forces which undermined confidence and brought on the recession, still are contended with, but the fog over business is not as thick as it was at the beginning of the year, providing the basis for a little more optimism with regard to the future outlook. Tangible evidence that recovery in business is getting under way is scant, but nevertheless it is sufficient to indicate that the slow start of the first quarter will give way to greater momentum in the second quarter.

Stocks Are Low

"While the recent freight rate decision of the Interstate Commerce Commission was a great disappointment to the carriers, it is believed the increases allowed will loosen up this demand somewhat, and at the same time create a favorable psychological effect in other directions. Moreover, buying may be accelerated by consumers whose stocks are low, in order to lay in some tonnage before the freight rate increases become effective, but it is felt the extent to which this is done, will depend largely on prospects for early turnover."

The anticipated iron and steel carloadings for the second quarter are along the lines of actual loadings for 1931, 1934 and 1935. Carloadings during the second quarter for 37 different classifications of commodities are expected to be approximately 25 per cent less than the corresponding period a year ago. Total actual car-

loadings in the second quarter of 1937 for all commodities amounted to 880,617 while the estimated amount for the second quarter of 1938 is 662,304. Iron and steel carloadings during the second quarter of 1937 were 224,616, with 134,770 estimated for the second quarter of 1938.

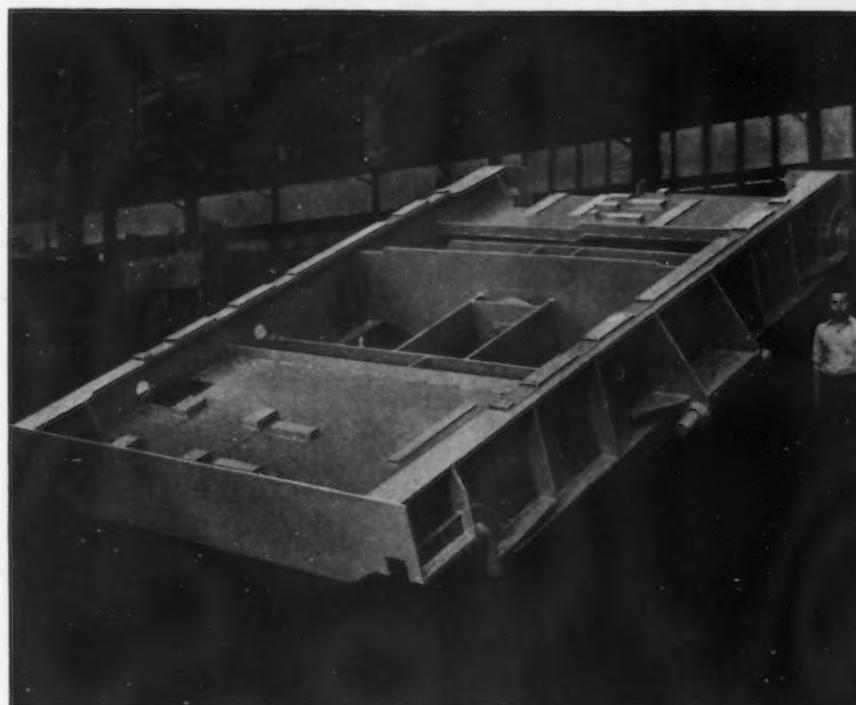
Leonard G. Hults, traffic manager, United Engineering & Foundry Co., Pittsburgh, was elected general chairman of the Allegheny Regional Advisory Board at the meeting.

Barb Wire Plant Workers Choose CIO

CHICAGO.—Employees of the Northwestern Barb Wire Co., Sterling, Ill., last week chose a CIO affiliate as collective bargaining agent in preference to an AFL unit by a vote of 687 to 482. An NLRB election was held under an agreement made following the strike and riot two weeks ago at the company's plant.

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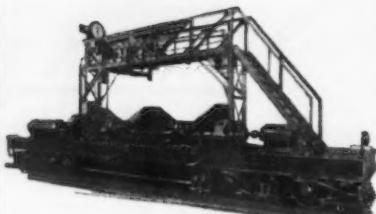
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J. & L.'s 1937 Tax Bill \$10.62 Preferred Share

CONTINUING an expanded program of additions and improvements started in 1935, Jones & Laughlin Steel Corp., Pittsburgh, during 1937, expended \$17,770,516 for capital additions and improvements, and \$18,078,507 for maintenance and replacements. This compares with similar expenditures made in 1936 of \$27,479,605 and \$12,084,229. Net fixed assets of the company at the end of 1937 amounted to \$158,248,396.

In reporting to stockholders, H. E. Lewis, chairman of the board, disclosed that the company's tax bill for 1937 was 58 per cent greater than in the previous year and was equal to \$10.62 a share on outstanding, 7 per cent preferred stock.

The business of the company during the first nine months of 1937 was considerably better than in any year since 1930 but the sharp decline in the steel industry reduced the company's operations to 22 per cent of ingot capacity in December, resulting in a substantial loss for the fourth quarter of 1937.

Net profit for 1937 amounted to \$4,788,799 compared with net profit of \$4,129,600 for 1936. Ingot output in 1937 averaged 67.5 per cent of capacity, compared with 65 per cent for the previous year.

Completion of major construction projects in 1937 included the company's 96-in. continuous strip sheet plant, 15 pit heating furnaces, modernization of open-hearth steel plant at the Pittsburgh Works, and 135-ton stationary open-hearth furnace at Aliquippa.

Inventories at the end of 1937 amounted to \$42,638,491 compared with \$36,333,081 at the end of 1936.

Scale Housing Uses 10 lb. of Plastic Material

REQUIRING 10 lb. 2 oz. of plastic material, the housing shell of a new scale recently announced by the Toledo Scale Co. is said to be the largest plastics job, with respect to the amount of material used, ever produced in commercial quantities. The housings of the older models weighed 160 lb. after the weighing mechanism, etc., had been inserted, as compared with 58 lb. for the new unit. The housing shell of the new scale, molded by the Reynolds Spring Co., is not a one piece mold, but is comprised of seven

pieces which are assembled together to form the complete shell. It was reported that the use of plastics in the shell made possible a saving of 100 lb. in the shipping weight of the finished product. The material used in molding the shell is Plaskon.

50th Anniversary of Denman & Davis

DENMAN & DAVIS, steel merchants of North Bergen, N. J., have recently celebrated their 50th anniversary. Starting as a partnership in New York, the company in 1902 was incorporated under New York State laws. Four years ago, the com-



R. S. DAVIS

pany moved to its present location in order to meet its needs for increased warehouse facilities and direct rail accommodation.

During this period, Denman & Davis have functioned as exclusive agents for the Crucible Steel Co. of America, American Rolling Mill Co., Carpenter Steel Co., Follansbee Brothers and other large producers.

Richard S. Davis, president, has actively operated the business during the last decade. He is the son of the founder. In addition to playing an important part in the introduction of electrical sheets and alloy punch and die steels for use therewith, Denman & Davis have done business with many interesting and unusual customers, such as Admiral Peary, whom they outfitted with steel requirements for his North Pole discovery trip.

Lincoln Welding Handbook Enlarged

A FIFTH, and considerably enlarged, edition of its "Procedure Handbook of Arc Welding Design and Practice" has been announced by the Lincoln Electric Co., Cleveland. The new volume contains 1012 pages, $5\frac{3}{4} \times 9$ in., and 1243 illustrations, and is priced at \$1.50, domestic postage prepaid.

Five of the eight principal sections of the book cover: Welding methods and equipment; technique of welding; procedures, speeds and costs for welding mild steel; structure and properties of weld metal; and weldability of metals.

The last three sections, accounting for 658 pages and 979 illustrations, cover: Designing for arc welded steel construction of machinery; designing for arc welded structures; and typical applications of arc welding in manufacturing, construction and maintenance.

New or revised information on the following subjects is included: Characteristics of the welding generator; A.W.S. weld symbols; welding costs; high-speed automatic welding; high tensile steels; cold rolled steel; medium high carbon steel; chrome steel; S.A.E. numbering system; A.W.S. filler metal specifications; and a large number of new welding applications.

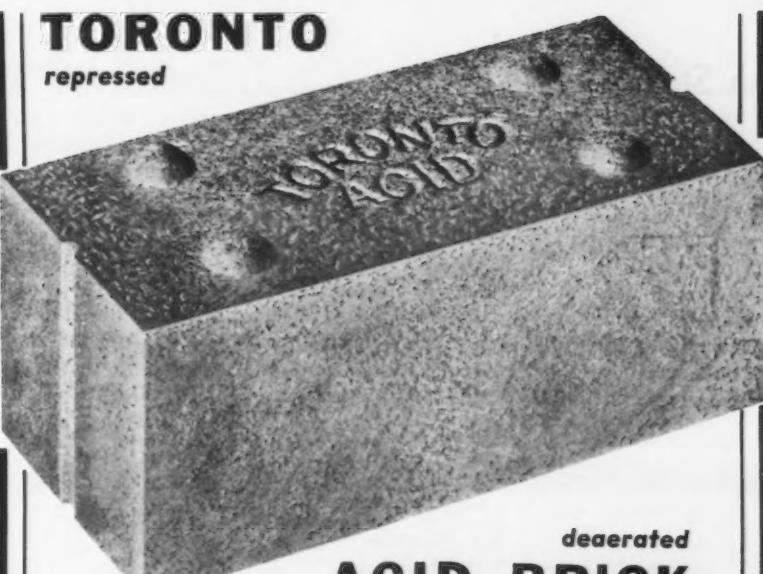
Important new machine design data include examples of how machine parts are built from standard rolled, steel shapes; design studies of machine parts and complete assemblies; and case studies of change-over to welded design. The structural design section includes new calculations based on up-to-date sizes of mill shapes and on accepted strength value of shielded arc welded metal; additional data on the design of welded girders and welding of thin plates to thick plates; six new studies in the design of trusses of various sizes and applications, and an illustrated discussion of the new type of beam construction.

German Steel Output Rises

GERMANY'S raw steel production in January advanced to 1,810,000 tons, as compared with 1,760,000 tons in December last, and 1,530,000 tons in January, 1937. Production per working day totaled 72,481 tons, against 67,884 tons in December.

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British Steel Output Still At High Level

LONDON (By mail).—Steel production in the United Kingdom continues at around the 13,000-ton a year level. The British Iron and Steel Federation reports that the output of steel ingots and castings in February was 1,057,600 tons. In no previous year has the February output ever exceeded 1,000,000 tons.

The February daily average was 44,066 tons, compared with 43,256 tons in January. The showing was not quite so good as in December last, when the daily average reached 44,152 tons.

Opinion is growing that, although production continues at an abnormally high rate, some falling off in activity may occur in the near future. In some quarters it is believed that the output for 1938 will be in the neighborhood of 12,000,000 tons, as against

12,964,000 tons last year. Prominent industrialists consider that if production averages out at about 85 per cent of capacity for the whole of 1938 it will be a very satisfactory level.

Pig iron production in February on a daily average basis was 24,761 tons, against 24,552 tons in January and 25,284 tons in December, 1937.

Deliveries Before End of March

During February seven blast furnaces ceased operations, while one resumed production after being damped down, a net loss of six furnaces during the month.

The most interesting recent development in the pig iron section has been the announcement by the Import Duties Advisory Committee that application has been made for the removal from the free list and the reimposition of an additional import duty on pig iron, other than that smelted with charcoal and vanadium titanium pig iron produced in electric furnaces. It was known that the foundry pig iron producers had applied for the reimposition, but considerable surprise was occasioned by the inclusion of basic iron, as it was thought that the British Iron and Steel Federation still had some iron to receive against contracts it had entered into when the steel works badly needed this material. Apparently, however, most deliveries against these contracts will be completed before the end of March and the normal supplies will then be sufficient for the British industry.

Will Duties on Steel be Raised?

Large tonnages of basic iron are imported regularly from India by arrangement with the Indian producers. Under the terms of the Ottawa Agreement, this iron enters the United Kingdom free of duty. As is well known, the Ottawa pact is to be revised, but it is most unlikely that the revision will materially alter the position of the Indian pig iron producers in the British market.

It is also believed that duties on steel will be automatically raised at the end of March, and this has caused a similar overloading to develop in the finished steel department of the market. To a certain extent this explains the current slackness in the demand for British steel, excluding the products of the heavy steel makers. A return to duties will make the market position in the second quarter of the year very interesting to watch.

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NEW YORK CHICAGO PITTSBURGH WINDSOR, ONT.

Head a United Front for America

(CONTINUED FROM PAGE 35)

Good workers are always scarce and hence work can always be found for such people if a company is making any progress at all.

"A marked case of technological progress in recent years consisted of the gradual substitution of metal for wood in automobile bodies and no doubt you could get from the three largest automobile companies a story as to what they did with their wood-workers as this change-over was gradually accomplished."

The second letter comes from an executive of one of our large hardware companies. It shows that men of this type are already thinking in terms of finding the answer to the second step.

I quote:

"Your editorial in March 3 issue of THE IRON AGE touches a very important subject, which if it could be properly handled would go a long way toward removing some present hindrances to sound employer-employee relations.

"You are quite right in emphasizing that this is not a job for Government or charity but a responsibility of management. And there isn't the slightest doubt that manufacturers can handle the situation not only with less expense, but with much better practical results than any Government body.

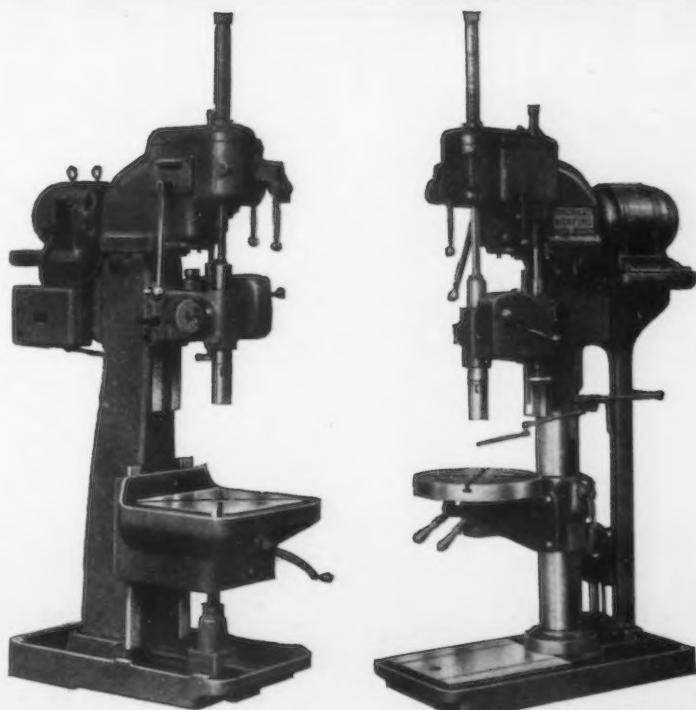
"If this situation can be properly taken care of it will expedite technological progress because it will remove one of the considerations which now has more effect than most people realize in the postponing of changes, because employers dislike to lay off men who have grown up in the industry.

"The steel industry is in an exceptionally favorable position to lead the way in this matter. It is constantly reducing staff through improved efficiency in some departments, or in certain mills, but it is also steadily putting men to work in other departments or other lines, that is, if we consider the industry as a whole. True—men who have spent years in one line of work cannot in all cases step over immediately into a different technique, but should not their years of service entitle them to a re-training period in shop-schools designed for

is not keeping step with the tempo of technological progress and every time we have a forward movement in industry we find a shortage of competent men.

"You can supply the rest of this picture. Let the steel industry set up its own schools in Pittsburgh, Detroit, Chicago, Birmingham, etc., and manage them with direct reference to the needs of the steel industry, opening the way for promotions from the

All geared 21" 24" and 28" SUPER SERVICE UPRIGHTS



More holes per dollar!

Greater productive capacity, adaptability, reliability, accuracy, convenience and economy available in Super Service Uprights assure "More Holes per Dollar."

Cincinnati Bickford invites the most searching comparison of these modern machines with other drilling machines. We are confident your analysis will convince you that Super Service Uprights offer maximum return in production per dollar of investment. The Cincinnati Bickford Tool Co., Oakley, Cincinnati, Ohio, U.S.A.

CINCINNATI BICKFORD

shops to the schools and from the schools to the shops.

"At Loughborough, England, is a college set up about 20 years ago to train mechanics for British industry. It has the best modern equipment. The term is three years. Starting with the rudiments, selected men alternate two weeks' study with two weeks' shop work, and progress steadily from minor to major studies in all sorts of engineering problems.

"These shops will take an order for 50 to 100 diesel engines or 500 electric motors, or airplane engines, and students learn from actual work of this kind. That college has never yet, even through the depression years, been able to turn out enough men to meet the demand.

Largest Steel Airplane Is Nearly Completed

In the final stages of construction and now nearly 90 per cent complete, the Douglas DC-4, new 65,000 lb. airliner, has been removed from its steel construction jigs and final assembly begun. Day and night crews are at work on it to complete it for test flights this spring. The fuselage, nearly 100 ft. long from nose to tail, was constructed in steel jigs with scaffolding erected around it for workmen. When completed it will have a

"You have hold of a live subject—don't let it drop."

"You have hold of a live subject. Don't let it drop."—Friend, you have said something there.

We can't afford to let it drop, and neither can you or the rest of the executives of American industry who believe in the efficiency formula.

If we, of this generation, do nothing more during the rest of our lives than to lay the foundations of the road that will lead to the eventual solution of this problem, we shall not have lived in vain.

Let us have a united front in the determination to accept this challenge which time and circumstance has offered us.

top speed of 240 miles per hr. and cruising range of 2200 miles. Its four air-cooled motors will develop 5600 hp. for the take-off.

Forty-two passengers, with berths for thirty, plus a crew of five and 3½ tons of mail, express and baggage will be carried in the plane which is being constructed on order for the five major airlines of the United States.

Assembly is being carried on in the Santa Monica plant of the Douglas Aircraft Co. This new plane represents the major accomplishment of the metal aircraft industry to date.

Machine Tool Firm's Head Refuses To Hoist Nazi Flag

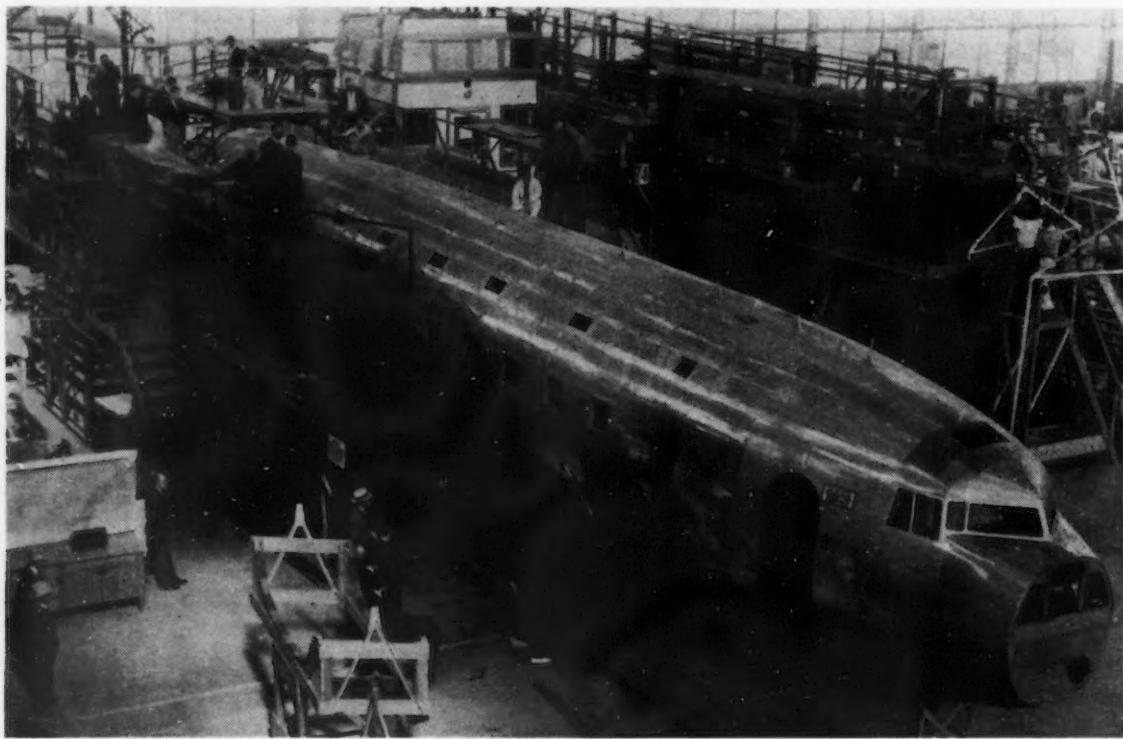
DR. VICTOR FRANCIS TLACH, Austrian consul general for Ohio, Kentucky and Tennessee, who recently refused to follow telegraphed orders to raise the Nazi flag over his office in Cleveland, is president of Darwin & Milner, Inc., Cleveland, tool steel manufacturer and dealer. Dr. Tlach was active in England in development of modern high chromium steel.

On the Assembly Line

(CONTINUED FROM PAGE 60)

member. This introduces another phase of automotive design of extreme interest to steel suppliers and manufacturing equipment purveyors. Tubular frames long have been built in Europe and some adaptation of them will be seen in one of next year's light cars. However, the frame members will be integral with the body. One principal tube will be about 4½ in. in diameter and will serve as a torque member and exhaust pipe muffler, if the present design is carried through to the production stage.

For the most part, General Motors cars will tend to the Cadillac 60 lines with running boards eliminated. This will mean the use of a broad band of stainless steel or similar ornamental trim along the lower body line. Built moldings may be more ornamental if present plans are carried through.



FUSELAGE of the Douglas DC-4, nearly 100 ft. long, being taken from jigs, sliding on tracks on hangar floor.

..PERSONALS..

DR. JOSEPH SLEPIAN has been appointed associate director to Director L. W. CHUBB, of Westinghouse Electric & Mfg. Co.'s research laboratories at East Pittsburgh. Dr. Slepian was graduated from Harvard in 1911 and received his doctor's degree in 1913. He has been with the Westinghouse company for 21 years, having started as an apprentice in the company's motor division. Dr. Slepian is well known as an inventor in the electrical field and has been prominent in that capacity during his association with Westinghouse.

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DR. PAUL D. MERICA, vice-president of the International Nickel Co., New York, was awarded the John Fritz Medal in recognition of his "important contributions to the development of alloys for industrial uses" following a dinner given in his honor by the American Institute of Mining and Metallurgical Engineers on March 17 at the Metropolitan Club in New York on his 49th birthday. The medal is awarded jointly by the four national engineering societies: the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

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ELLERY R. FITCH has been appointed chief engineer of the Bendix-Westinghouse Automotive Air Brake Co. He is a graduate of Syracuse University and prior to his present appointment was research engineer of the Westinghouse Air Brake Co. at Wilmerding, Del.

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BURNS DREESE, manager of the Dayton, Ohio, scales division of Hobart Mfg. Co., Troy, Ohio, has been named assistant general manager. EDWARD BERTHTOLD has been appointed assistant to the president of Hobart Mfg. Co.

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C. C. CARLTON has been elected president of the Automotive Parts and Equipment Association. Mr. Carlton is secretary of Motor Wheel Corp. Other newly elected officers are HUGH H. C. WEED, vice-president of the Carter Carburetor Corp. as vice-president; M. C. DEWITT, vice-president of Champion Spark Plug Co., secretary,

and D. W. RODGER, vice-president of Federal Mogul Corp., treasurer. CLARENCE O. SKINNER remains general manager of the association. In addition the following directors have just been elected by the entire parts industry for 1938; P. C. CRAWFORD, president of Thompson Products, Inc.; C. S. DAVIS, president of Borg-Warner Corp.; CHARLES GETLER, president of Houdaille-Hershey Corp.; JOHN P. MAHONEY, vice-president of Bendix Products; C. E. WILSON, vice-president of General Motors Corp.; C. C. BRADFORD, president of Eaton Mfg. Co.; D. H. KELLY, vice-president of Electric Auto-Lite; E. A. HALL, president of the Hall Mfg. Co.; E. F. DEACON, president of Climax Engineering and head of the Internal Combustion

Engine Institute, and J. E. OTIS, Jr., president of Stewart-Warner Corp. Messrs. Wilson, Davis, Getler and Crawford were elected to serve two-year terms.

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GEORGE T. MAHANEY and JAMES D. PLATT have been appointed Eastern and Western retail sales managers, respectively, of the diesel engine division, General Motors Sales Corp., it has been announced by WILLIAM J. DAVIDSON, general sales manager. Largely their activities will put them in contact with buyers for industry. Mr. Mahaney attended Gettysburg College, receiving his degree in 1922. In the shipyards he learned the machinist's trade. For four years he was

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with an independent truck manufacturer at Wabash, Ind., then he joined the Chevrolet Motor division of General Motors. Mr. Platt is a graduate of the Sheffield Scientific School at Yale University. Upon graduation, he joined the Portland Oxygen & Hydrogen Co., Portland, Ore., working his way up to a vice-presidency in the six years he was with the firm. When it was sold to another concern, he joined General Motors as a special representative for Buick, Oldsmobile and Pontiac divisions. In 1934 he became district manager for Pontiac at Portland and Seattle.

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HAROLD CRIST, formerly with the Marmon Motor Co. and Stutz Motor Car Co. and the Maxwell Motor Co., has been named factory superintendent of American Bantam Car Co. according to R. O. GILL, vice-president in charge of production.

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R. H. DAISLEY, Detroit; W. H. WALLACE, Detroit, and W. H. CRAWFORD, Massillon, Ohio, have been made vice-presidents of the Eaton Mfg. Co., Cleveland. Mr. Daisley is manager of the Wilcox-Rich division and has been with the company 16 years. Mr. Wallace is manager of the spring division at Detroit and also has been in the Eaton organization for 16 years. Mr. Crawford founded the Reliance Mfg. Co. at Massillon 26 years ago and has managed it as an Eaton division since it was absorbed in 1931.

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DR. H. W. GILLETT, chief technical advisor, Battelle Memorial Institute, Columbus, has been chosen to deliver the 1939 Howe Memorial Lecture of the American Institute of Mining and Metallurgical Engineers. The Howe Lecture, established in 1923 in memory of Henry Marion Howe, past-president of the A.I.M.E., is given each year by someone of recognized, outstanding achievement in iron and steel metallurgy or metallography.

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KLAUS L. HANSEN, consulting engineer, Harnischfeger Corp., Milwaukee, has been made the initial recipient of the honorary professional degree of electrical engineer ever to be granted by the College of Electrical Engineering of the Milwaukee School of Engineering. He is director of the welding institute of the school, a Fellow of the A. I. E. E., vice-president of the Milwaukee chapter of the American Welding Society, and a director of the Engineers Society of Milwaukee.

C. I. AUTEN, formerly vice-president of the Truscon Steel Co., Youngstown, has joined the Tennessee Coal, Iron & Railroad Co. as a sales engineer, with duties to be especially directed to the use of steel in houses. After receiving his formal engineering education at Michigan State College, he spent a year and a half in railroad engineering. He later joined

tive activity in the electrical engineering profession.

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R. V. ISHAM, who has been identified for the past 10 years with the Sheffield Steel Corp., Kansas City, supervising dealer sales and later in charge of jobber sales, has been appointed manager of sales of the wire division.

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EARL E. BATES, formerly assistant general manager of sales of A. M. Castle & Co., Chicago, has been made general manager of sales. HARRY CHRISTENSEN, heretofore manager of the special products division, succeeds Mr. Bates in his former position, and OSCAR F. OLSEN has been made manager of railroad sales.

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C. P. CULBERT has been appointed vice-president and general sales manager of the Nu-Way Corp., Rock Island, Ill.

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W. F. BENDER, formerly Pittsburgh representative for the General Alloys Co., Boston, has resigned.

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L. A. BASSETT, who has been president of the Hendrick Mfg. Co., Carbondale, Pa., since 1909, this year celebrates a continuous record of 60 years with the company which he joined as an office boy in 1878.

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ANTHONY SNYDER, director of the physical testing laboratory of the Morse Twist Drill & Machine Co., Athol, Mass., is to speak on "The Proper Selection and Use of Tools" at the April meeting of the Providence section of the American Society for Metals at the Engineering Society Building on April 6.

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HERMAN L. KROUSE has been appointed representative in northern Indiana for the turbine pump division of the Roots-Connersville, Blower Corp., Connersville, Ind. A. K. Howell Co. will handle sales in eastern Missouri and contingent parts of Illinois, and B. T. EHRNMAN will represent the company in the St. Louis area.

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EDWARD L. SOLOMON, of Max Solomon Co., Pittsburgh, has been appointed chairman of the arbitration committee of the Institute of Scrap Iron and Steel. JOSEPH WILKOFF, of the company of the same name in Youngstown, has been made chairman of the traffic committee and MORRIS

(CONTINUED ON PAGE 86)



C. I. AUTEN

Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	February 1938	January 1938	February 1937	Two Months 1937	Two Months 1936
Steel Ingots: (gross tons)					
Monthly output ^a	1,703,245	1,732,266	4,724,894	9,138,726	3,435,511
Average weekly output ^a	425,811	391,031	1,103,458	1,085,012	408,420
Per cent of capacity ^a	31.73	29.14	84.25	82.84	30.44
Pig Iron: (gross tons)					
Monthly output ^b	1,298,268	1,429,085	2,999,218	6,210,718	2,727,353
Raw Materials:					
Coke output ^c (net tons)		2,879,574	4,283,681	4,629,532	
Lake ore consumed ^d (gross tons)	1,776,585	1,923,056	4,443,306	9,137,618	3,699,641
Castings: (net tons)					
Malleable, production ^e		18,575	57,295	110,933	
Malleable, orders ^e		16,819	60,187	114,257	
Steel, production ^e		31,519	94,620	184,402	
Steel, orders ^e		29,481	98,383	213,533	
Finished Steel: (net tons)					
Trackwork shipments ^f	3,014	3,135	8,153	15,399	6,149
Fabricated shape orders ^f		71,619	101,710	255,516	
Fabricated shape shipments ^f		86,421	102,196	202,130	
Fabricated plate orders ^f		23,422	32,375	73,794	
U. S. Steel Corp. shipments ^f	474,723	518,322	1,133,724	2,283,642	993,045
Ohio River steel shipments ^b		73,250	88,170	184,570	
Fabricated Products:					
Automobile production ^g	205,100	228,074	383,702	783,340	433,174
Construction contracts ^g	\$119,038 ^h	\$195,472 ^h	\$188,591 ^h	\$431,435 ^h	\$314,510 ^h
Steel barrels shipped ^g			724,738	1,644,028	
Steel furniture shipments ^g			\$2,167 ^h	\$4,437 ^h	
Steel boiler orders ^g (sq. ft.)		501,603	862,093	1,516,252	
Locomotives ordered ^g	17	9	33	79	26
Freight cars ordered ^g	109	25	10,532	21,413	109
Machine tool index ⁱ	75.7	118.4	165.2	207.7 ^j	112.3 ^j
Foundry equipment index ^m	90.4	76.8	249.5	241.2 ^j	94.0 ^j
Non-Ferrous Metals: (net tons)					
Lead shipments ⁿ		34,923	50,375	96,093	
Lead stocks ⁿ		133,401	156,832		
Zinc shipments ⁿ	21,540	24,931	46,953	98,180	46,471
Zinc stocks ⁿ	108,138	88,532	24,616		
Tin deliveries ^p (gross tons)	4,420	5,550	7,675	15,290	9,970
Refined copper deliveries ^q	32,282	30,705	77,486	164,277	62,987
Refined copper stocks ^q	326,244	299,133	136,121		
Exports: (gross tons)					
Total iron and steel ^r		586,102	290,987	492,679	
All rolled steel ^r		188,032	115,335	225,655	
Finished steel ^r		147,284	104,007	207,683	
Scrap ^r		355,781	143,197	212,081	
Imports: (gross tons)					
Total iron and steel ^r		29,631	41,628	84,691	
Pig iron ^r		9,747	11,340	23,774	
All rolled steel ^r		17,680	23,134	47,543	
British Production: (gross tons)					
Pig iron ^s	693,300	761,100	603,700	1,254,400	1,454,400
Steel Ingots ^s	1,057,600	1,081,400	995,900	1,994,800	2,139,000

^f Three months' average. ^h \$000 omitted.

Source of data: ^a American Iron and Steel Institute; ^b THE IRON AGE; ^c Bureau of Mines; ^d Lake Superior Iron Ore Association; ^e Bureau of the Census; ^f American Institute of Steel Construction; ^g United States Steel Corp.; ^h United States Engineer, Pittsburgh; ⁱ Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; ^j F. W. Dodge Corp.—37 Eastern states; ^k Railway Age; ^l National Machine Tool Builders Association; ^m Foundry Equipment Manufacturers Association; ⁿ American Bureau of Metal Statistics; ^o American Zinc Institute, Inc.; ^p New York Commodity Exchange, Inc.; ^q Copper Institute; ^r Department of Commerce; ^s British Iron and Steel Federation.

SCHAPIRO, of the Boston Iron & Metal Co., Baltimore, has been appointed to a similar post on the export committee.

* * *

GARNET P. PHILLIPS, metallurgist for the International Harvester Co., Chicago, was scheduled as the prin-



CHARLES S. PEARCE, whose appointment as secretary of the Porcelain Enamel Institute, Chicago, was announced in these columns on March 10.

cipal speaker on March 21 at the dinner meeting of the Quad-City chapter of the American Foundrymen's Association at the Blackhawk Hotel, Davenport, Iowa. He was to discuss cupola practice.

* * *

JOHN S. WRIGHT has been appointed sales representative for the metropolitan Philadelphia district, including southern and southwestern New Jersey, Delaware and the eastern section of Maryland, including Baltimore, by A. Milne & Co., New York. He will make his headquarters in the Bourse Building, Philadelphia.

* * *

FRANK A. HUNTER has resigned as vice-president and general manager of sales of the Hunter Saw & Machine Co., Pittsburgh, and will represent the company in the Western territory.

* * *

EDWARD H. PATTERSON has been elected president of the Fort Pitt Bridge Co., Pittsburgh, succeeding H. R. Bickle who will continue as vice-president of the company.

Measure Would Force Borrowers From U. S. to Observe Wagner Act

WASHINGTON.—Broadening the scope of the Wagner Labor Act to bring recipients of Government contracts and Federal loans under its provisions is the objective of a Wagner-sponsored measure on which hearings started Monday.

J. Warren Madden, NLRB chairman, told the Senate Education and Labor Committee during the hearing that the effects of the bill would be "most desirable." Senator Wagner followed with the promise that the bill would "guarantee fundamental industrial liberties already firmly embedded in our national life."

Under its provisions, holders of Government contracts and those borrowing money through Government facilities would be required to adhere to the Wagner Act despite the intra-state character of their business just as Government contractors are now

required under the terms of the Walsh-Healey Act to follow wage and hour regulations formulated by the Government contract board in the Labor Department.

The penalty for failure to comply with the law or with NLRB orders would be cancellation of the contract or of the Federal loan as the case may be.

While early approval of the measure is expected to be given by the Education and Labor Committee, the bill's final outcome is doubtful. Sponsors have been represented as somewhat reluctant to bring the measure to the floor at an early date, fearful that an attempt will be made to write into the bill a clause, for example, which would protect the AFL craft union principle—a step carrying potentialities which might end in opening up the Wagner Act itself for revision.

Change in Patent Laws Opposed

WASHINGTON.—H. T. Bradner, of the Lees, Bradner Co., Cleveland, manufacturer of gear cutters, told a House patent sub-committee on Monday that the McFarlane bill requiring mandatory licensing of patents when a patentee fails to develop his patent within three years would be a severe blow to his company and that he was "unalterably opposed" to the measure.

Mr. Bradner protested on the grounds that the proposal would upset existing law and throw open to companies financially able to supply the market plans on which small concerns had spent years in developing. Asked if revision of the measure would meet his objections, the witness frankly described the bill as "cock-eyed."

Representative McFarlane, Democrat of Texas, author of the bill, earlier in the session characterized his proposal as an anti-monopoly measure designed to prohibit the withholding of patents. Mr. Bradner took objection to the claim, pointing out that "ostensibly it's a help to small businesses but actually it's a boon to the big fellow."

Other participants at the hearing included A. J. Stock, of the Stock Engineering Co., Cleveland, and a score of patent attorneys from widely scattered sections.

Two other measures also were up for consideration at the session. They were:

The Connery bill permitting licensing when owners of patents who are competitors combine to dominate an industry; and

A measure introduced by Representative O'Malley, Democrat of Wisconsin, designed to provide counsel through the facilities of the Patent Office for the defense and prosecution of rights of indigent patentees.

Girdler Sees Need for Replenishing Stocks

NEED for replenishing stocks of steel products offers the most tangible immediate promise of some improvement in the demand for steel this spring, Tom M. Girdler, Republic Steel Corp. chairman, said this week in a radio broadcast sponsored by Secretary of Commerce Daniel C. Roper.

The steel industry's operating rate is below the general level of manufacturing activity, he said.

Radiant Tube Annealing Covers Discussed At A.I.S.E. Meeting

YOUNGSTOWN.—Approximately 400 members and guests of the Association of Iron and Steel Engineers inspected Republic Steel Corp.'s electric weld tube mills at Youngstown Monday, and at a banquet later in the evening heard C. H. Carpenter, Lee Wilson Engineering Co., Cleveland, discuss "Radiant Tube Annealing Covers."

Tracing the history of annealing furnaces and their importance to the processing of strips and sheets, Mr. Carpenter paid tribute to the early pioneers responsible for the beginning of the present-day radiant tube annealing covers.

He said, "It is only fair to acknowledge the contribution of the electric furnace engineers who furnished the idea, developed the principles of the scheme, gave direction to the development of proper materials for thermal ceramic insulation, developed alloy inner covers, and produced special atmosphere generating equipment. Much of the phenomenal success of the radiant tube annealing cover is due to their pioneer work."

Describes Advantages

Discussing the advantages of radiant tube annealing covers, the speaker pointed out that they included a cheaper B.t.u. and an accurate temperature control. Mr. Carpenter cited various applications of different makes of portable covers. He described a cylindrical type of radiant tube annealing cover equipped with a fan and designed to meet consumer requirement for high quality, low tonnage, short cycle charges.

Following the presentation of Mr. Carpenter's paper, a round-table discussion on maintenance, fuel, labor and initial costs and other factors was participated in by J. H. Strassburger, Weirton Steel Co.; A. J. Fisher, Bethlehem Steel Co.; A. L. Billeter, Carnegie-Illinois Steel Corp.; J. L. Miller, T. J. Ess and H. T. Watts, all of Republic Steel Corp.; F. E. Grenley, Wheeling Steel Corp., and Mr. Carpenter. Some of these men were of the opinion that repair and maintenance cost on radiant tube annealing covers were about half that of the "in and out" type furnaces. One engineer claimed that labor costs on

the radiant tube furnaces were about 60 per cent of that on the "in and out" type.

Fuel Costs Compared

Another participant stressed that manufacturers of radiant tube furnaces, even though they have reduced fuel consumption, should make further contributions along this line. In a later discussion it was brought out that most of the companies are con-

tinually working on this feature and are meeting with success.

Another participant, while stating that fuel costs at his plant on radiant tube furnaces were about one-third that of the "in and out" type furnace, claimed in cases where operations were intermittent due to business conditions, fuel costs were even less than one third. However, during the discussion from the floor later, it was said that cheaper fuels are often used in the "in and out," thus bringing down the cost on this factor.

After the special round-table discussion, the meeting was thrown open to the guests and members for their comments.

ASTE Show Sales Exceed \$1,000,000

DETROIT.—Plans of the American Society of Tool Engineers, perfected during the convention in Detroit recently, include a semi-annual meeting to be held next October at some ASTE charter town yet to be selected. This semi-annual meeting will include technical sessions, directors' meeting and open house in the industrial plants in the city selected, the society has announced.

The directors approved company membership of an affiliate nature with annual dues of \$25, endorsed plans to charter several new chapters and decided to rebate ASTE members who

attended the society's Machine Tool and Progress Exhibition one cent a mile based on the distance between Detroit and headquarters of the members' chapter.

Sales approximating a million dollars or more were completed or initiated at the exhibition which closed March 12, according to Ford R. Lamb, executive secretary. Total registered attendance at the show was 23,755, of which less than 1000 were classified as "general public." In addition, he reports that the approximate value of the 162 exhibits was one million dollars.

The society has announced the chartering of its 17th chapter at an organization meeting at St. Louis held March 3. The following were elected officers: Chairman, E. A. Doogan, tool engineer, Huffmann-Ligonier Co.; treasurer, H. P. Linders, master mechanic, Wagner Electric Corp.; secretary, H. F. Tomasek, die designer, General Metal Products Co.

Metal Radio Tubes Used in German Cars

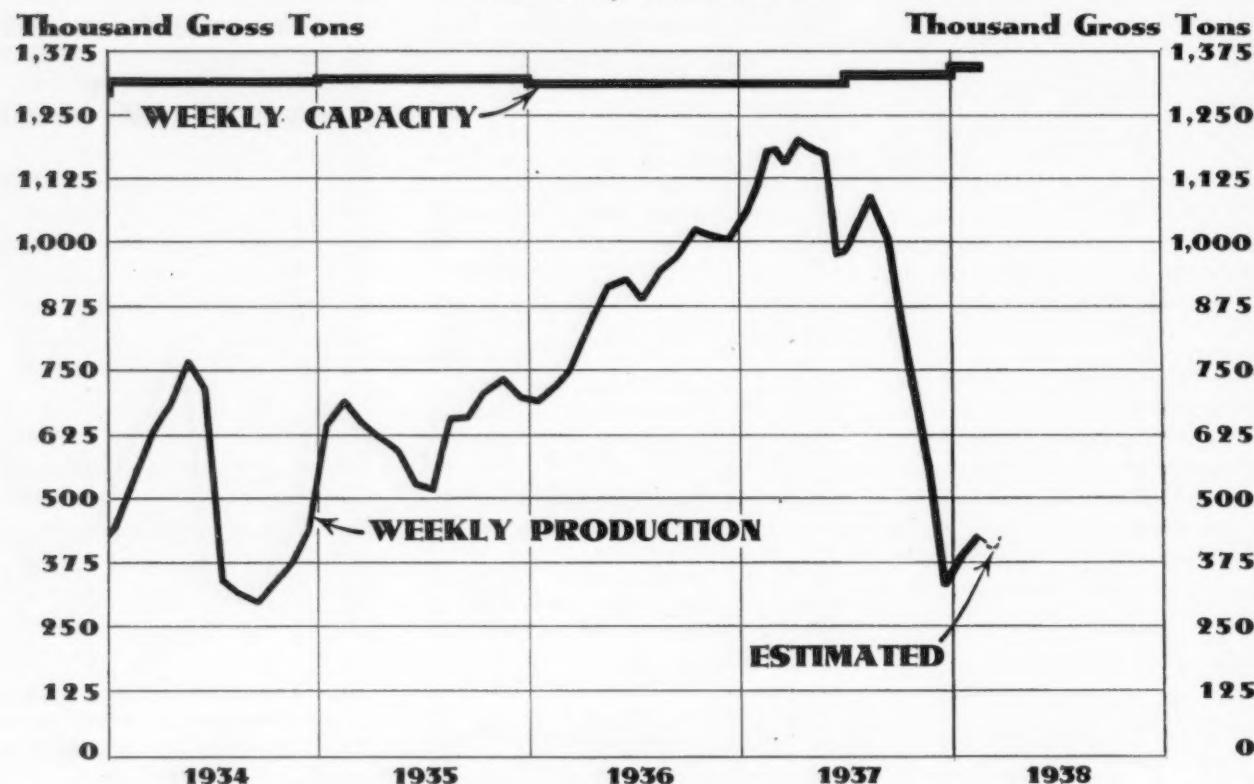
AT the annual German automobile show recently held in Berlin, several of the new automobile radio sets which were exhibited were equipped with steel tubes in place of the conventional glass tubes, according to a report by the American Consulate General at Berlin made public by the Department of Commerce. It was reported that this was the first time that metal radio tubes have appeared on the German market as standard equipment for receiving sets.

CAN YOU ANSWER THIS QUESTION?

THE question has been raised among oil men as to the most suitable threads to be used on the coupling nut and the collar on the female end of forged steel pipe unions. Some are insisting that a coarse Acme thread is preferable to the Standard U. S. form thread of finer pitch, which has been in use for many years. Defenders of the latter maintain that this form produces a tighter joint with less pressure on the wrench and that it will not come loose as readily from vibration. Besides, the Standard is easier to produce than the Acme thread. The question raised, therefore, is whether or not there is any merit in a coarse Acme thread on a pipe union. Answers are solicited.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1938



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	30.0	29.0
Chicago	31.5	30.0
Valleys	31.0	29.0
Philadelphia	29.0	29.0
Cleveland	26.0	26.0
Wheeling	61.0	57.0
Buffalo	27.0	19.5
Detroit	33.0	33.0
Southern	45.0	45.0
S. Ohio River	23.0	23.0
Western	30.0	30.0
St. Louis	37.0	40.5
Eastern	50.0	50.0
Aggregate	34.0	32.0

Weekly Booking of Construction Steel

	Mar. 22, 1938	Week Ended			Year to Date	
		Mar. 15, 1938	Feb. 21, 1938	Mar. 23, 1938	1938	1937
Fabricated structural steel awards	13,900	13,800	12,770	18,900	140,225	289,045
Fabricated plate awards	575	2,050	2,675	2,670	41,550	35,735
Steel sheet piling awards	2,500	625	210	0	5,880	14,650
Reinforcing bar awards	6,600	2,400	8,375	2,120	51,255	39,070
Total Lettings of Construction Steel	23,575	18,875	24,030	23,690	238,910	378,500

... .SUMMARY OF THE WEEK. . . .

▼ ▼ ▼

... Ingot output rises to 34 per cent as mild seasonal improvement comes.

• • •

... Arrival of spring weather pushes wire products sales up sharply.

• • •

... Railroad orders meager; automobile industry scarcely a factor.

• • •

WITH a rise of two points to 34 per cent of capacity, the steel industry is producing ingots at the highest rate since mid-November. Probably for the first time since the first half of 1937 orders are running in excess of shipments. While this change of trend is too small to be highly significant, the industry derives some encouragement from even a minor release from the stalemate of recent months.

Two matters of vital importance to industry, which are taking shape in Washington, are counted upon to exert a favorable influence on steel business if the right solutions are found. One is the revision of corporate and capital gains taxes, now engaging the attention of the United States Senate, and the other is the proposed reorganization of the railroad structure.

The advance in freight rates, which will become generally effective on March 28, has not exerted the slightest effect upon the buying policies of the railroads, though it is responsible for a part of the current miscellaneous buying, as some consumers are specifying immediate shipments of steel to escape the higher freight charges in effect next month.

That much of the current buying is a logical seasonal development is indicated, however, by the fact that the sudden arrival of spring weather throughout the country has expanded sales of wire products, particularly wire fencing, more than any other class of steel products. As an example, an outstanding wire manufacturing unit has increased its operations from 21 per cent two weeks ago to 33 per cent this week. Much of the buying of wire products has come from farm areas, where considerable frozen buying power might be released if general conditions affecting the farmers' markets were more favorable. The farm equipment industry is contributing more support to the Chicago steel industry, on a relative basis, than any other branch of the steel consuming field.

The Chicago territory, where both steel products and consuming interests are widely diversified, has shown perhaps the most marked increase in new steel buying in the past week. One producer there reports a 20 per cent gain in orders over the previous week and expects a lift in its steel ingot production of 10 percentage points within two weeks. The rate for the entire district has gone up one and a half points to 31½ per cent, two mills showing an advance.

At Pittsburgh, the rate is up one point to 30 per cent, while the nearby Weirton-Wheeling district, where production of light steels predominates, has gained four points to 61 per cent. In the Youngstown area production has been raised two points to 31 per cent. An even sharper gain has occurred at Buffalo, where output has risen from 19½ per cent last week to 27 per cent.

AN interesting change in the character of business within the past week is an increase of noticeable proportions in the number and size of inquiries for specific undertakings both in the construction field and in projects for factory fabrication.

Structural steel lettings in the week totaled only 14,000 tons, but new inquiries total 24,000 tons, of which 12,000 tons is for bridges for the Southern Pacific Railway. Awards of reinforcing bars were 6600 tons.

The keenest disappointments to the steel industry are the failure of the automobile manufacturers to make appreciable gains in production and the continued withholding of orders by the railroads. Widespread reports of prospective reductions in automobile prices may be holding some seasonal buying in check. However, April, May and June are expected to be the motor car industry's best period of the year. Excepting Ford, automobile manufacturers' inventories are much reduced and fairly substantial steel buying is expected next month.

Railroad orders, although meager, include 10 Diesel-electric switching locomotives ordered by the New Haven from the American Locomotive Co., 4175 tons of rails for the Chicago & Great Western and the release of 10,930 tons of rails to the Colorado mill against an order for 22,000 tons placed last December. The Erie may buy 15,000 tons of rails.

Export business in steel and pig iron both here and abroad has dwindled. A further reduction in world export prices is indicated by cabled reports from London to meet low quotations allegedly made by American mills which are not a party to the cartel agreement.

A minor decline in steel scrap at Pittsburgh has lowered THE IRON AGE scrap composite price 4c. a ton to \$13.54.

...PITTSBURGH...

...Steel sales showing small gain over February.

• • •

...Spring weather sharpens demand for wire products.

• • •

...Inquiries for structural steel expand.

PITTSBURGH, March 22.—Total steel bookings in the past week were about the same as in the previous week in number and tonnage, and new business so far this month is roughly estimated at about 10 per cent ahead of the like period in February.

Demand for steel products appears to be moving sideways, and there is little indication that conditions are much different than they were a few weeks ago. Increased diversification in new business continues but a fair portion of this is attributable to ordinary seasonal influences. Especially is this true with regard to wire and wire products, bars, galvanized sheets and tin plate.

There appear to be brighter prospects for heavy structural steel with appearance during the past week of a considerable number of inquiries for privately financed projects. In addition, many states have appropriated a large amount of money for bridges, hospitals and public buildings.

Carnegie-Illinois Steel Corp. will furnish about 2500 tons of steel sheet piling for an airport at Alameda, Cal., and the American Bridge Co., Pittsburgh, will fabricate 1700 tons of material for the railroad transportation building at New York World's Fair.

Tin plate specifications have improved some during the past few weeks but operations continue at 55 per cent.

The sudden opening up of spring weather has resulted in a moderate increase in demand for merchant wire products during the past few days.

Wire fence sales are exceptionally active and some mills are behind in shipments. Bookings of other steel products are practically unchanged from recent levels, and the total volume of current business is somewhat less than had been anticipated.

Ingot output in the Pittsburgh district this week is up fractionally to 30 per cent of capacity while the Wheeling-Weirton rate has advanced four points to 61 per cent.

Pig Iron

Demand continues spotty, customers taking only absolute requirements. Although stocks have been whittled down considerably, no change from hand-to-mouth buying policies is expected in the near future.

Semi-Finished Steel

Demand from detached mills has expanded moderately in the past few weeks. The increases have occurred mostly in tin bar sales, reflecting improved activity among non-integrated tin plate makers. Other semi-finished steel products are moving a trifle better but buying continues intermittent in line with irregular operating schedules at customers' plants.

Bars, Plates and Shapes

Hot rolled bar orders have declined slightly in the past week but tonnages to date are about on a par with the same time last month. Miscellaneous demand still heads the list of current bookings. A fair amount of inquiries for privately financed building projects has come out in the past few weeks. Although tonnages are not

large, the trend may be significant. The same condition holds true for actual awards. American Bridge Co., Pittsburgh, has been awarded a contract for the railroad transportation building at the New York World's Fair, requiring 1700 tons of plates and shapes.

Sheets and Strip

Aggregate sheet demand is no less than a week ago. Some companies report moderate increase in the number of orders and tonnages. Current bookings consist almost entirely of miscellaneous purchases. Automotive buying continues at low ebb, with occasional fill-in orders. Hot and cold rolled strip steel specifications are about on a par with those of a week ago and finishing mill operations are still intermittent.

Reinforcing Bars

Two fair sized awards in the past week involved a warehouse at Philadelphia taking 1400 tons of bars, to Bethlehem Steel Co., and a tuberculosis sanatorium at Mont Alto, Pa., requiring 1400 tons of bars, to Sweet's Steel Co., Williamsport, Pa. Medium sized awards were fairly numerous and new projects were about as active as a week ago.

Wire

Total wire sales are as good, if not better than a week ago. Although hand-to-mouth buying continues, replenishments are being made at shorter intervals, indicating expansion of seasonal spring demand. Manufacturers' wire bookings are up slightly from a week ago and in some instances fill-in orders from automotive companies have materialized.

Tin Plate

Packers' can specifications have improved some during the past week. Can makers are getting ready for the pea pack and bookings from makers of milk cans have expanded some. Coincident with the canning of gingerale is a trial merchandising of canned grape juice. Mill operations continue

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

	Mar. 22, 1938	Mar. 15, 1938	Feb. 21, 1938	Mar. 23, 1937
<i>Per Gross Ton:</i>				
Rails, heavy, at mill	\$42.50	\$42.50	\$42.50	\$42.50
Light rails, Pittsburgh	43.00	43.00	43.00	43.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	37.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	37.00
Slabs, Pittsburgh	37.00	37.00	37.00	37.00
Forging billets, Pittsburgh	43.00	43.00	43.00	43.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	47.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	2.10

Finished Steel

	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.45
Bars, Chicago	2.50	2.50	2.50	2.50
Bars, Cleveland	2.50	2.50	2.50	2.50
Bars, New York	2.79	2.79	2.79	2.78
Plates, Pittsburgh	2.25	2.25	2.25	2.25
Plates, Chicago	2.30	2.30	2.30	2.30
Plates, New York	2.54	2.54	2.54	2.53
Structural shapes, P'gh	2.25	2.25	2.25	2.25
Structural shapes, Chicago	2.30	2.30	2.30	2.30
Structural shapes, New York	2.5125	2.5125	2.5125	2.5025
Cold-finished bars, P'gh	2.90	2.90	2.90	2.90
Hot-rolled strips, P'gh	2.40	2.40	2.40	2.40
Cold-rolled strips, P'gh	3.20	3.20	3.20	3.20
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	3.15
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	3.25
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.80
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.90
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.50
Cold-rolled sheets, No. 20, Pittsburgh	3.45	3.45	3.45	3.55
Cold-rolled sheets, No. 20, Gary	3.55	3.55	3.55	3.65
Wire nails, Pittsburgh	2.75	2.75	2.75	2.75
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.80
Plain wire, Pittsburgh	2.90	2.90	2.90	2.90
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.95
Barbed wire, galv., P'gh	3.40	3.40	3.40	3.40
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	3.45
Tin plate, 100 lb. box, P'gh	\$5.35	\$5.35	\$5.35	\$4.85

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

March 22, 1938
One week ago
One month ago
One year ago

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

HIGH

LOW

1938	2.605c., Mar. 9	2.330c., Mar. 2
1937	2.330c., Dec. 28	2.084c., Mar. 10
1936	2.130c., Oct. 1	2.124c., Jan. 8
1935	2.199c., Apr. 24	2.008c., Jan. 2
1934	2.015c., Oct. 3	1.867c., Apr. 18
1933	1.977c., Oct. 4	1.926c., Feb. 2
1932	2.037c., Jan. 13	1.945c., Dec. 29
1931	2.273c., Jan. 7	2.018c., Dec. 9
1930	2.317c., Apr. 2	2.273c., Oct. 29
1929	2.286c., Dec. 11	2.217c., July 17
1928	2.402c., Jan. 4	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
23.25

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

HIGH

LOW

1938	\$23.25, Mar. 9	\$20.25, Feb. 16
1937	19.73, Nov. 24	18.73, Aug. 11
1936	18.84, Nov. 5	17.83, May 14
1935	17.90, May 1	16.90, Jan. 27
1934	16.90, Dec. 5	13.56, Jan. 3
1933	14.81, Jan. 5	13.56, Dec. 6
1932	15.90, Jan. 6	14.79, Dec. 15
1931	18.21, Jan. 7	15.90, Dec. 16
1930	18.71, May 14	18.21, Dec. 17
1929	18.59, Nov. 27	17.04, July 24
1928	19.71, Jan. 4	17.54, Nov. 1

Steel Scrap

\$13.54 a Gross Ton
13.58
13.67
21.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

HIGH

LOW

1938	\$14.00, Jan. 4	\$13.42, Mar. 8
1937	21.92, Mar. 30	12.92, Nov. 16
1936	17.75, Dec. 21	12.67, June 9
1935	13.42, Dec. 10	10.33, Apr. 23
1934	13.00, Mar. 13	9.50, Sept. 25
1933	12.25, Aug. 8	6.75, Jan. 3
1932	8.50, Jan. 12	6.43, July 5
1931	11.33, Jan. 6	8.50, Dec. 29
1930	15.00, Feb. 18	11.25, Dec. 9
1929	17.58, Jan. 29	14.08, Dec. 3
1928	16.50, Dec. 31	13.08, July 2
1927	15.25, Jan. 17	13.08, Nov. 22

at 55 per cent, with a likelihood of a slightly higher rate next week.

Tubular Goods

Oil-country goods specifications have expanded slightly in the past week and orders so far this month are ahead of the same period in February. It is expected that the gradual improvement in demand will continue. Sales of other tubular products are practically unchanged from recent levels.

...BOSTON...

...Foundrymen in New England slightly more hopeful.

BOSTON, March 22.—Pig iron sales the past week approximated 600 tons. Furnace representatives report sentiment among foundrymen as more hopeful due to a belief that Federal taxes will be reduced, and in that case general business will improve. Currently, the machine tool builders appear to be much better off than most other industries. Many foundries have comfortable backlog of orders that were held up last fall due to a slump in manufacturing. When they are told to go ahead with these orders, operating schedules will be on a five day per week basis at least, and possibly six day.

....BUFFALO....

...Improvement in orders brings gain in operations.

BUFFALO, March 22.—With some increase in business and the highest operation in many months, the local steel picture this week shows improvement. Mills report a slight pick-up in miscellaneous orders for finished steel. Bethlehem's Lackawanna plant has added another open hearth to the active list, making eight in all. Republic Steel Corp. continues to operate two and Wickwire-Spencer Steel Co. also has two in use, but one will be shut down for repairs in a short time.

Bethlehem has reopened its Seneca sheet division for the production of galvanized sheets.

Warehouses report a little improvement in business in March over the

preceding month. The increased activities center in hot rolled bars and the specialties including cold finished and alloys.

Structural fabricators are interested in plans made public by Neisner Brothers, Inc., Rochester, N. Y., for a store building in Buffalo's business center to require 500 tons of shapes. This job bids March 25. A bridge across the Scariaqua Creek in Buffalo will require 120 tons of structural; bids go in March 24. Scio, N. Y. (Allegheny County) school, bidding April 4, will require 200 tons of structural. The \$480,000 Cuba, N. Y., school will be up for bids soon. Most of these jobs will require reinforcing bars, but in small amounts.

...CINCINNATI...

...Demand for sheets not expanding; ingot output unchanged.

CINCINNATI, March 22.—Sheet steel demand is unchanged. The continued brisk demand for galvanized sheets is a large factor in sustaining present business since automobile and other users move cautiously on commitments. The motor industry is in the market, but only for relatively light orders. The trade, however, anticipates early improvement on the basis of reports that material for die tryouts and preliminary work on new models will be required earlier this year. Household equipment manufacturers are also conservative, holding purchases to moderate levels.

Production of ingot steel is unchanged. While one unit cooled all open hearths toward the end of last week, it reheated three this week. Nine furnaces out of 34 in the district are in operation.

There is virtually no demand for pig iron. However, melters are taking increased tonnages against contacts. Foundry operations are unchanged at 30 per cent.

Industrial demand for steel out of warehouse is about equal to the rate established in January.

Republic Steel Corp., Cleveland, announces the appointment of W. B. Young Supply Co., Kansas City, Mo., as jobber for Republic's tubular products. The firm, organized 54 years ago, has branches in Hutchinson, Kan., and Joplin, Mo.

...BIRMINGHAM...

...Fair improvement noted in steel orders and inquiries.

BIRMINGHAM, March 22.—Steel demand is moving along at a moderate but steady rate, sufficient to maintain operations at far better than the national rate and to bring expectations of further improvement. Some good inquiries are pending for bars, plates and shapes from barges, bridges and tanks. Wire products buying continues fair. Sheet demand is slack, and there is nothing new in the railroad market, although some additional tonnage is hoped for. Tin plate orders are being booked and further shipments may now be expected even before the mill is in regular operation.

The pig iron market is dull. Foundries still show no interest in forward commitments and continue to buy on a hand-to-mouth basis. Spot business in March has shown a slight improvement over February.

Open hearths ranged from 9 to 11 last week, and this week 11 are scheduled. Blast furnaces are the same, with 12 active.

Independent Union Loses At Steel and Wire Plant

CHICAGO.—The National Labor Relations Board has denied the petition of the Steel and Wire Workers Protective Association, an independent union at the American Steel & Wire Co. plant in Waukegan, Ill., for an election to determine that organization's right to represent all employees in collective bargaining.

On the basis of evidence taken at a public hearing on the question in Waukegan the board found that the unit claimed by the independent group was inappropriate since it was for the Waukegan plant only. It held further that the SWOC contract with the United States Steel Corp. for its subsidiaries is based on an employer unit covering all 12 plants of the company. Since the independent union is organized on an employer basis as well, the appropriate unit for collective bargaining is taken to include all 12 plants, and not a single mill, thus making the protective association's claimed majority at Waukegan of no significance in this case.

• • • CHICAGO • • •

... Ingot output gains to 31½% in district.

• • •

... One mill expects 10-point increase in two weeks.

• • •

... Miscellaneous buying accounts for improvement.

CHICAGO, March 22.—Additional open-hearth activity in this district has resulted in a 1½ point increase in operations to 31½ per cent of capacity, two mills figuring in the advance.

Sales of one leading producer last week were reported as being 20 per cent above those of the previous week, and a 10 point increase in operations is expected over the next two weeks. March bookings will exceed those of February in all offices, though in some the rise will not be as great as is usual for this time of year.

No particular industry is responsible for the better showings, order books displaying a wide diversification of entries. Generally, however, it may be said that miscellaneous consuming groups, supported by some buying from implement and tractor plants, are the biggest factor behind the advance. Some rail buying, as the Great Western's order of 4175 tons, is being seen, but other than an occasional order for track accessories, little activity is evident from the carriers. No pickup has yet been noticed from the automobile industry, the lack of buying from which is being felt through a wide range of steel products.

It has been stated here quite generally this week that stocks in many plants seem lower than is safe and are at the level where, even at present operations, they will be entirely exhausted unless soon replenished. Much of the current buying is being traced to the condition of inventories.

Since most consumers still are following the hand-to-mouth policy of buying, jobbers are securing business from many plants which normally buy only in mill quantities.

Mill interest still being negligible, scrap prices are unchanged, heavy

melting steel being quoted at \$12 to \$12.50.

Pig Iron

Releases against contracts are continuing to be received at last week's rate, which some offices reported as being 40 per cent above the corresponding period in February. Foundry coke shipments are holding up also to the 15 per cent improvement shown last week. An increase almost too slight to mention has been seen in activity at automobile foundries, the bulk of the advance in orders coming from a general group of melters. Low stocks are given the credit for much of the tonnage being shipped today, some foundries having allowed their inventories to become far too low.

Structural Shapes and Reinforcing Bars

Construction activity in this district continues at a low level, State highway lettings providing most of the projects. The only large job in this area is the Omaha Dodge Street bridge, which is still pending because of financial details that are being worked out. Fabricators state that some improvement may be seen soon.

Sheets

With automobile assemblies still not rising appreciably, demand for cold rolled sheets is practically negligible. Interest in other grades of sheets is only fair but is diversified, with makers of refrigerators, culverts and farm equipment taking the lead.

Plates

No buying of importance has been reported from the railroads and even repair programs are being held back

to a considerable extent in many shops. A fair degree of interest is being exhibited by fabricators and miscellaneous users.

Bars

Farm implement manufacturers are the chief stimulus to current bar business, no increase yet being reported from motor car builders. Forgers, who were fairly active not long ago, are slowing down somewhat at present. Jobbers demand continues at about the level of the past few weeks.

Wire and Wire Products

Steady increases have been seen in wire sales over the past month, and a leading interest here predicts a further 20 per cent advance in the next fortnight. Chief factors contributing to this rise are sales of wire for farm and manufacturing use. Industrial demand is diversified and, although less in volume than farm buying, is greater in tonnage. For another month at least, it is believed that the rural areas will be taking wire products in greater quantities. Farm buying, this year, is still far below normal.

New England Foundry Conference Planned

THE second annual New England foundry conference will be held April 8 and 9 at the Massachusetts Institute of Technology, Cambridge, Mass. The conference is being held under the joint sponsorship of the New England Foundrymen's Association and the American Foundrymen's Association and will embrace many phases of foundry operation, including dust control, solidification as related to casting design, safety, sand control, casting defects, housekeeping, and training foundry engineers. The session on Foundry safety will be dedicated to the memory of Luman S. Brown, who for many years was president of the Springfield Facing Co. R. F. Harrington, Hunt-Spiller Mfg. Co., is chairman of the committee making the arrangements for the conference.

CANADA

... Good volume of new business reported.

TORONTO, March 22.—Canadian steel interests continue to report good volume of new business and state that in addition to the improvement in domestic sales, export orders are increasing.

Addressing shareholders at the annual meeting in Montreal, Arthur Cross, president of Dominion Steel & Coal Corp., stated that the Sydney steel plant has worked at capacity since the beginning of the year and business in sight at the present time indicates the probability of a reasonably good volume of operation for the balance of the year. He stated that export business, especially to the British market, is being well maintained and should throughout the year compare favorably with last year's volume. Sales of iron ore have been arranged which indicates a full year's production for the Wabana mine.

Following the announcement a week ago that Canadian Locomotive Works, Kingston, Ont., had received a contract for 15 Pacific type locomotives, word now has been received that Montreal Locomotive Co., Montreal, has been awarded a contract for 10 Mountain type engines by the Canadian Pacific Railway. In addition the Canadian Pacific has placed orders for 2800 freight cars, of which Canadian Car & Foundry Co., Montreal, was awarded 1000 box cars, 50 automobile cars, 200 stone cars and 200 flat cars, while National Steel Car Corp., Hamilton, Ont., was awarded 950 box cars 200 hopper cars and 100 gondola cars. Eastern Steel Co. Amherst, N. S., received contract for 50 concentrate cars from the C.P.R.

Further indications of betterment in the steel industry come with announcement that Algoma Steel Corp., Sault Ste. Marie, Ont., will install tin plate mills. Beaver Foundry & Furnace Works, Tillsonburg, Ont., is starting work immediately on an addition to its foundry. St. Maurice Power Corp., Montreal, has been granted provincial authority to start work on the proposed \$10,000,000 power project at La Tuque, Que.

Demand for merchant pig iron is steady with volume holding to levels of the preceding two or three weeks. Local blast furnace representatives have opened books for second quarter contracts and inquiries from melters are making their appearance, although

actual booking is somewhat slow at the moment.

Scrap dealers have made no general revision in price lists, although with new offerings now coming in from the rural districts some dealers are paying the top of the spread for supplies and others are said to be offering above published prices for desirable lots. Low prices paid by dealers for scrap is not conducive to selling by those holding accumulations, many of whom look for higher prices later in the year.

Wash., April 12 on the Puget Island Bridge over the lower Columbia River and the Hylebos Waterway Bridge at Tacoma, involving about 1750 tons.

.GREAT BRITAIN..

... Continental mills depressed; fresh declines in export prices expected.

LONDON, March 21 (By Cable).—Continental steel mills are depressed and spring demand is expected to be disappointing. In Belgium only 40 blast furnaces are operating. France is reducing production; one steel works is working on 32-hr. week basis.

Germany reports an agreement with the Steel Cartel and the United States covering 86 per cent of the total United States exportable output. The remainder is retaining liberty as regards exports, but such export tonnage is probably not over 10,000 tons monthly, of which 50 per cent is to countries where Europe competes; the rest is to Canada and United States possessions. Dutch reports express doubt as to the value of this agreement and expect fresh price declines.

Norway is to establish a new iron and steel works at Trondjheim.

The British pig iron market is quiet. There is a general anticipation that the 33 1/3 per cent duties, which were removed a year ago, are to be replaced after March. Cartel steel and non-cartel steel duties are to be restored to old rates after March 31. The steel market is quiet except for armaments. Tin plate works are operating at 50 per cent. Unfilled orders amount to 3,000,000 base boxes.

Sheet and tube works are only running part time, but moderate revival of special steels for the motor industry is a hopeful sign.

Galvanized sheet exports in February dropped to a new low record at 5400 tons.

Total imports to the United Kingdom during February amounted to 230,000 tons, of which 36,500 tons came from United States; 7500 tons of pig iron was exported of which none went to the United States. Total exports of all kinds of iron and steel amounted to 156,000 tons.

.SAN FRANCISCO..

... More activity in structural steel and reinforcing bars.

SAN FRANCISCO, March 21.—Long awaited activity in fabricated steel and reinforcing bars appeared in the Pacific Coast steel market last week, and both the tonnage involved and number of projects showed marked improvement. Further gains may be expected, especially in the Los Angeles area, and a nearly normal spring market is not an impossibility, steel men believe.

Bethlehem Steel Co. is low bidder on the bulk of about 5700 tons of trashrack structures for Grand Coulee Dam. This company has an order from the dam contractor for 5000 tons of shapes for a trestle to be used in construction work.

Over 2500 tons of sheet piling to be used in construction of bulkheads and a pier at the Alameda Naval Air Station will be purchased from Columbia Steel Co., San Francisco, by the San Francisco Bridge Co., general contractor. The exact tonnage will not be known until work has progressed further.

The United States Engineer, Los Angeles, has asked for bids on 900 tons of sheet piling and 244 tons of shapes, and has taken bids on 150 tons of cast iron pipe to be used in flood control work in that area. Railroad and highway engineers are still engaged in surveying flood damage, and many believe that repair tonnage will not be felt on the market for two months.

Preliminary figures indicate that from 1400 to 2000 tons of shapes will be required for a new I. Magnin Co., Los Angeles, apparel store.

Bids will be taken at Olympia,

... CLEVELAND ...

... **Ingot production gains at Youngstown.**

... **March bookings gain 20% in some products.**

... **Some buying to save freight rate increases.**

CLEVELAND, March 22.—Ingot production rate for Youngstown and nearby cities is up two points to 31 per cent this week due to better operations at two plants, while the Cleveland-Lorain average is unchanged at 26 per cent.

Improvement in new business for steel producers continues at a slow pace from week to week, but in a number of products such as bars, sheets, wire and tubular goods March bookings are showing gains of approximately 20 per cent over February. This is principally due to demand from miscellaneous sources, in the absence of much automotive or railroad equipment business. There is an increasing disposition on the part of steel makers to look toward the last six months for this year's outstanding recovery.

During the past week seasonal requirements have become more pronounced. Merchant wire products are beginning to move better in agricultural sections of the northern part of the nation. A fair amount of export business has contributed to the volume of bookings recently in sheets, tubular goods and wire.

The new freight rate increase, which becomes operative March 28, has had some effect toward increasing orders for steel and expediting shipments to distant points. Part of the improvement in tubular products is traceable to consumers' desires to make savings on freight prior to the deadline on the old rates. In a number of cases, consumers' purchasing agents and branch offices have been urged to effect such savings wherever possible.

The lack of sustained demand from such principal consumers as the automobile industry and the railroads is keenly felt. Only the most necessary buying is being done by the carriers. The Erie, which has been unable to

buy for some time, may seek around 15,000 tons of rails soon.

From the rate of activity in connection with new tools, dies and patterns, the belief is growing that the automobile industry's next series of models may be forthcoming sooner than customary.

Pig iron markets reflect about the same degree of improvement as finished steel products. Scrap is lifeless. Confronted with large stocks of ore at furnaces and docks, totaling 37,158,401 tons on March 1, the ore shipping season will be dull this spring.

Iron Ore

Consumption of Lake Superior iron ore by blast furnaces during the short month of February totaled 1,776,585 gross tons, compared with 1,923,0566 tons in January and 4,443,306 tons in February, 1937, according to the report of the Lake Superior Iron Ore Association. Ore on hand at furnaces March 1, including Eastern plants using only a small proportion of Lake ore, totaled 31,383,307 tons, and at Lake Erie docks, 5,775,094 tons, a total of 37,158,401 tons, which compares with 38,881,832 tons one month earlier and 22,417,692 tons one year previous. There were 71 furnaces depending principally on Lake Superior ore in blast Feb. 28, unchanged from the adjusted total of the previous monthly report, and compared with 146 active on the same date in 1937.

Pig Iron

Shipments this month are running approximately 20 per cent ahead of the February volume and although large orders are infrequent, producers detect signs of greater hopefulness among numerous consumers. A number of Michigan automotive foundries during the last few weeks have become

slightly more active. Some of these are reported to be averaging about one day a week more than their production schedule in January and February. The operators are uncertain from week to week how well their activity will be maintained. Most Michigan foundries are now busy on patterns for the 1939 models. Iron producers keenly note the lack of buying on the part of foundries supplying the railroads.

Wire and Wire Products

Owing to the demand for merchant wire products, March bookings are 20 to 25 per cent ahead of the comparable February period. Sales in the Northern agricultural areas are gradually becoming more active, with demand from the Northwest section still to get under way. Manufacturers' wire is moving considerably more slowly than the merchant items. Export demand for plain wire, nails and barbed wire is only fair.

Bars, Shapes and Plates

Requirements from miscellaneous buyers and the agricultural equipment industry continue to sustain the hot-rolled bar market. Some producers this week report that orders are approximately 20 per cent ahead of those in the corresponding February period. A small gain over last month is also being shown in the plate market. Structural steel inquiries are light in this vicinity, the principal current project being 175 tons for an administration building at the Buffalo airport. However, first contracts for the large main street bridge in Cleveland will be called for in the near future.

Sheets and Strip

New business in hot and cold rolled sheets is averaging this month around 15 per cent ahead of the corresponding February period. Most of the buying is being done by miscellaneous consumers, the automotive industry being conspicuous by its comparatively small requirements. Moderate export bookings are noted, helping to maintain mill activity, with prices varying on this class of business and all below the domestic levels. In Ohio a number

of specialty firms using sheets and strip are active, while schedules of several refrigerator, stove and washing machine manufacturers are fairly well maintained.

Tubular Goods

Producers here report shipments to the oil country have picked up moderately, partly due to the desire of some buyers to effect savings on freight prior to the inauguration of the re-

cently announced rate increase. Persons who have visited Western and Southwestern oil districts recently report that sentiment there seems to be that, if the price of crude holds up, drilling will be maintained fairly well and casing requirements will not suffer unduly. Standard pipe remains quiet and activity is light in line pipe, although seasonal requirements in the northern part of the nation should be felt soon. An Ohio producer has booked a 24-mile line in the West.

ect in addition to the usual continuous mill accessories.

Other cold mill equipment for different locations in Japan include a 42-in. four-high reversing cold mill, a four-high 32-in. non-reversing mill and two four-high 56-in. cold sheet mills.

England's second large hot and cold strip mill was ordered during the latter part of 1937 by John Summers & Sons, Ltd., Shotton, Chester, England. The size and capacity of this mill has not been disclosed but it is estimated that the width will be somewhere between 56 and 66 in. and the annual capacity between 600,000 and 700,000 tons annually.

In addition to the above continuous mills, Machinoimport Co. at Moscow, U.S.S.R., recently placed an order for a four-high 112-in. sheet and strip mill.

The manufacture of these mills for foreign interests might possibly be the beginning of a sheet and strip mill construction cycle similar to that experienced in the United States during the past 10 years, but obviously of smaller proportions.

...PIPE LINES...

Panhandle-Eastern Pipe Line Co., 101 West Eleventh Street, Kansas City, Mo., plans 20-in. welded steel pipe line from present main line at Bowling Green, Mo., to St. Louis, about 65 miles, for natural gas transmission to latter area; also welded steel pipe lines at St. Louis for local distribution. Cost over \$2,500,000 with booster stations, control plants and other operating facilities.

McClanahan-Leonard Pipe Line Co., Mount Pleasant, Mich., has arranged for purchase of steel pipe line gathering system of Pure Transportation Co., in Crystal Township oil field, Montcalm County, Mich., and will make extensions for connection with main pipe line for crude oil transmission.

Standard Oil Co. of Louisiana, Inc., Continental Bank Building, Shreveport, La., has let contract to Latex Construction Co., Shreveport, for 4-in. welded steel pipe line from Cotton Valley oil field, Webster Parish, La., to company pumping station at Weller and thence to Minden, La., about 11 miles, for crude oil transmission. Connection will be made with main pipe line system at latter point.

Bureau of Supplies and Accounts, Navy Department, Washington, closes bids March 25 for 400 lb. of corrosion-resisting steel pipe and 1585 lb. of corrosion-resisting steel tubing (Schedule 3059) for White Plains, Md.

United States Engineer Office, Vicksburg, Miss., asks bids until April 19 for 8590 lb. of black steel pipe in connection with construction of outlet structures for Sardis dam; also for 16,700 lb. of wrought iron pipe. Bids for dam construction close at same time.

Llano, Tex., will ask bids soon for pipe line system for municipal gas distribution. Cost close to \$100,000. Rody & Clouse, Fort Worth, Tex., are consulting engineers.

Simrall Pipe Line Corp., an interest of Standard Oil Co. of Ohio, Midland Building, Cleveland, is negotiating for purchase of welded steel pipe line of Pure Transportation Co., in Purtell and Buckeye districts, Mich., used for crude oil transmission, and will make extensions for connection with main steel pipe line from Michigan oil fields to Toledo, Ohio, where crude oil is furnished to local refinery of parent company.

Texas-New Mexico Pipe Line Co., Houston, Tex., operated jointly by Texas Co., Houston; Sinclair-Prairie Oil Co., Colcord Building, Oklahoma City, Okla.; Tidewater Pipe Line Co., Philcade Building, Tulsa, Okla., and Cities Service Pipe Line Co., Kennedy Building, Tulsa, has awarded contract to Oklahoma Construction Co., Oklahoma City, for new 8-in. welded steel pipe line from Lynch station, Lea County, N. M., to new oil field area in southeastern part of New Mexico, about 18 miles, for crude oil transmission. Cost over

\$150,000 with booster pumping stations and operating facilities.

Newark, N. J., plans 48-in. steel aqueduct in parts of First Avenue and North Seventh Street for main water line. Cost about \$388,800. Financing will be arranged through Federal aid. City water department, City Hall, is in charge.

Continuous Mills Abroad to Go Into Operation This Year

THREE of the four large continuous hot and cold sheet and wide strip mills ordered by interests outside of the United States during the past few years are expected to be in operation during 1938, while the fourth mill will probably turn over early in 1939.

Two of the strip mills will be operating before the middle of 1938. The first one will probably be at the Zaporostal Steel Works, Zaporozie, U.S.S.R. This plant is a 66-in. continuous hot strip mill with a capacity of approximately 650,000 tons annually. Cold mill and accessory equipment are also part of the works. The hot mill is a duplicate of the Ford Motor Co.'s 56-in. mill (which is now being enlarged to a 66-in. mill).

The second mill to go into operation before the middle of this year will be the one ordered by Richard Thomas & Co., Ltd., at Ebbw Vale, England. This is a 56-in. hot mill with an annual capacity of approximately 600,000 tons. Cold mills and other accessories are included.

Equipment for the third mill is now being shipped to Japan for Nippon Seitetsu Kaisha, Ltd. The hot mill in this case is a 43-in. mill, duplicate of the one built for Carnegie-Illinois Steel Corp.'s McDonald mill, Youngstown. A 42-in. five-stand tandem cold mill is also part of this particular proj-

Labor Board Drops Charges Against Editor H. W. Barclay

WASHINGTON.—As an apparent admission that it had attempted to overreach its power and has abandoned the case, Chairman J. Warren Madden of the National Labor Relations Board on Monday said the board proposes no further action "at this time" against Hartley W. Barclay, editor of *Mill and Factory*.

The board had served a subpoena on Barclay requiring him to appear before a trial examiner at Steubenville, Ohio, with records on which Barclay based an article regarding hearings in the Weirton Steel Co. case. Mr. Barclay severely criticised the hearings as a "colossal burlesque staged with taxpayers' money," and accused the board of CIO-bias. He refused to appear before the trial examiner and contended that the attempt was being made to interfere with the freedom of the press in violation of the constitution.

The board's action aroused a storm of editorial criticism in which it was charged it was seeking to control the press.

... NEW YORK ...

... Steel business has gained moderately.

• • •

... More inquiries appearing for specific projects.

• • •

... Lack of railroad buying a keen disappointment.

NEW YORK, March 22.—While March steel business has shown an increase over that of the corresponding period in February for all steel sellers in this district, the amount of the gain has been disappointing, considering that this month usually brings the greatest impulse in seasonal activity. While some of the increases are 25 per cent or more, a percentage figure is somewhat misleading owing to the small volume of bookings last month. In tonnage the gains have not been impressive, but some encouragement is derived from the fact that the low point in new business has apparently been passed.

The most encouraging development of the past week is the appearance of a great number of inquiries for definite undertakings. During the past several months business has consisted mainly of fill-in lots for stock.

None of the railroads which buy in this territory has shown any indications of change from the greatly restricted buying policy of recent months. Not even routine orders or inquiries have been issued. The New York Central usually asks for Clayton Act bids each quarter, but there has been no indication as yet as to whether this policy will be followed for the second quarter.

Plates and Sheets

Plate orders are showing a slight improvement, and the prospects are brighter than they have been. The Department of Sanitation of the city of New York has announced its intention to build 30 arc welded steel scows, involving 4000 tons of plates. Bids were due March 22 on the 50 subway cars for the Interborough, and it is probable that Eastern car shops will share the business as in the past. Alco Products, Inc., is doing some repair work for several refineries of the Cities Service Co. in the East, but

what plate tonnages are involved is still a question as some of the older equipment is to be reconverted.

Sheet orders are still well above the volume recorded up to this time last month, although the new business is spotty and not all are sharing in it. Tonnages are still confined to carlots at the most, but it seems a little easier to get orders.

Avery & Saul Co. of South Boston was low bidder on the license plate material for the State of Massachusetts, bids for which were opened March 15. The low bid was \$3.71 per

100 lb. for 750 tons of 23-gage 6½ in. wide, resquared, hot rolled, pickled annealed strip, to be delivered in 50-ton lots beginning July, 1938. Mill bids, based on the present freight rates, were uniformly \$4.2725.

Pig Iron

Buying of pig iron by the foundries is still meager and on an as-needed basis. Light carloads of 25 tons represent on average order, with the highest booking of the week 250 tons. Foundry operations show no sign of a pickup, but many jobbers are operating their cupolas three days a week on a melt that could ordinarily be made in a day. Some of the production foundries at their own risk are even piling up an inventory of finished castings for their regular customers on standard items.

During the past 10 days, export inquiries have totaled between 6000 and 7000 tons, but new orders are absent.

CAST IRON PIPE..

Springfield, Mass., has placed 20,000 ft. of 8-in. and small amounts of various sizes of pipe up to 16 in. with United States Pipe & Foundry Co. It also placed a tonnage of transite pressure pipe with Johns-Manville Co.

Denver plans 30-in. pipe for main water supply in several streets, including parts of South Franklin and South Clarkson Streets, East Virginia Avenue and Marion Street Parkway. Cost about \$140,000. Financing for \$102,000 of amount noted is being arranged through Federal aid. Board of Water Commissioners is in charge.

Trempealeau, Wis., closes bids April 4 for pipe lines for water system; also for electric-operated pumping machinery and accessories, and water meters. Robert Cramer & Sons, 647 West Virginia Street, Milwaukee, are consulting engineers.

Port Sanilac, Mich., plans pipe lines for water system. Cost about \$20,000. M. D. Collins, Port Huron, Mich., is consulting engineer.

Albemarle, N. C., plans pipe lines for extensions in water system and other waterworks installation. Cost about \$40,000. Bond issue has been voted in that amount. G. S. Moore is city engineer.

Menlo, Iowa, plans about three tons of 8-in., 67 tons of 6-in., and 147 tons of 4-in., for water system; also for about three and one-half tons of specials, 50,000-gal. elevated steel tank on 100-ft. steel tower, and other waterworks installation.

Helper, Utah, plans pipe lines for extensions in water system. Appropriation of about \$25,000 is being arranged for this and improvements in sewage system. Financing is being arranged through Federal aid.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 1 for 3504 lin. ft. of 6-in. cast iron pipe and quantity of fittings (Schedule 3069) for Mare Island, Cal., Navy Yard.

Odessa, N. Y., will ask bids soon for pipe lines for water system and other waterworks installation. Cost about \$70,000. William T. Field Engineers, Inc., Flower Building, Waterbury, N. Y., is consulting engineer.

Buffalo plans extensions in main water line from Gowanda to Perrysburg district for service for J. N. Adam Memorial Hospital at that place. Cost about \$75,000.

Olathe, Kan., will take bids soon for about 8000 ft. of pipe for main water line from Lake Olathe to municipal reservoir; also for pumping machinery with rated capacity of about 400-gal. per min. and auxiliary equipment for new pumping station at water source noted. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Eugene, Ore., Willamette Street Water Supply District has awarded 125 tons of ¾ to 6-in. pipe and fittings to Pacific Water Works Supply Co., Seattle.

Whittier, Cal., has opened bids on 12,000 ft. of 6-in. pipe.

Monroe, Wash., has opened bids on 4000 ft. of 4-in., 5100 ft. of 6-in., 5880 ft. of 8-in., 8240 ft. of 10-in. pipe and fittings. Steel and transite alternates.

American Cast Iron Pipe Co., Los Angeles, is low bidder on 194 tons of 4 and 16-in. pipe for Los Angeles Department of Water and Power.

United States Pipe & Foundry Co., San Francisco, is low bidder on 456 ft. of 48-in. pipe for United States Engineer, Los Angeles.

• . PHILADELPHIA . .

... **Pig iron releases in better volume.**

• . .
... **Operations remain at 29 per cent.**
• . .

... **Domestic scrap prices unchanged.**

PHILADELPHIA, March 22.—The continued absence of the railroads from the steel market has perceptibly dulled the optimism that was noticeable in this district over the past two weeks. It was anticipated that the smallness of the freight rate increase would preclude any large scale car construction or rehabilitation programs, but it was felt that orders for ordinary maintenance work would be forthcoming as soon as the rate situation was settled. As yet, however, these orders have not been released. The heavy steel inventories carried by the various railroad yards adds to the unlikelihood of any large orders being placed for some time.

The shipyards are looked to as an important factor in spring business, but outside of the boats already under construction on the ways, for which most of the required steel has already been bought, it is doubtful if any sizeable tonnages from this source will be placed before late summer. This situation has been further aggravated by delays on bidding on several small ships due to last minute changes in design. In all probability a substantial portion of the ships authorized under the recently passed naval bill will be placed with local shipbuilders, but the time required to get these ships off the drawing boards and into the yards has eliminated them as a factor in the immediate situation.

Operations continue at 29 per cent of capacity but it is questionable whether the volume of current sales is supporting rolling schedules. The scrap market is very quiet. No new mill sales have been reported, leaving prices unchanged from the previous week.

Pig Iron

Although in most cases the size of foundry stock piles continues to discourage buying, there has been a

slight increase in the rate of melting operations in this district and a corresponding increase in releases against existing contracts. Many jobbing plants that had heretofore been casting only two days a week have raised their schedules to four days. Some of this betterment is attributed to purchases made by shipbuilders in anticipation of Navy contracts.

Shapes and Plates

With the State institutional building program about completed and private construction nil, activity in the structural steel market is at an unusually low level. The only award in the week over 100 tons was for a junior high school building at Bala-Cynwyd. Bids on a State building prison building at Mt. Gretna, calling for 500 tons of shapes, will close April 15. Opening of bids on a Penn State College building, State College, Pa., has been postponed until April 5. Plate orders from domestic sources are very light, with buyers covering only for their immediate requirements. Export buying, which in the past has accounted for much of the mill activity is tapering, although there are still several small proposals before the trade notably one for 2000 tons for Japan. An eastern mill booked about 4000 tons of ship plates for Holland.

Reinforcing Bars

Awards in the past week were in slightly better volume than in any of the previous several weeks, but with the awarding of 1400 tons for a hospital building at Mount Alto to Sweet's Steel Co., the largest portion of the State program is completed. Jobbers' sales are very light, consisting entirely of small fill-in lots.

Sheets and Strip

Warehouse sales are about 40 per cent of last summer's volume and for the current month to date are about on the same level as February. How-

ever, some sellers report a small improvement in the past 10 days, which, if sustained, will probably make the total for March slightly better than that of February. Small lot orders, particularly, are more numerous, coming from diversified sources. Releases from automobile parts fabricating plants are few and far between and until assemblies rise much higher than they are at present little is expected from these factors.

Imports

The following iron and steel imports were received during the past week: 3881 tons of chrome ore from the Philippine Islands; 5044 tons of chrome ore from Cuba; 151 tons of sponge iron, 79 tons of wire rods, 45 tons of steel tubes, 44 tons of steel forgings and 46 tons of steel bars from Sweden.

• . . ST. LOUIS . . .

... **Finished steel demand light; inventories low.**

ST. LOUIS, March 22.—Demand for finished steel continues light. Inventories in hands of consumers are low, but there seems to be little disposition to replenish them. A container manufacturer bought 200 tons of sheets, and a wagon manufacturer bought 100 tons of sheets and shapes.

Fabricators of structural steel in the district are estimated to be operating at 25 per cent of capacity, with only small jobs being placed. One fabricator whose plant has been closed for nine weeks reopened for a contract of less than 100 tons. Laclede Steel Co. has been awarded 187 tons of reinforcing bars for a domestic science building at Springfield, Ill.

Shipments of pig iron continue to show improvement over the corresponding period last month. However, buying continues on a hand-to-mouth basis, and melters are not anticipating their requirements. While inventories of finished products in hands of agricultural implement manufacturers are ample, they are continuing to operate, although at a slightly lower rate than a year ago. Operations in the stove foundries in Belleville, Ill., were handicapped by the absence of workmen whose homes were in the wake of the tornado there last week, but there was no physical damage to the plants.

Ingot operations are at 35.2 per cent of capacity.

REINFORCING STEEL

**...Awards of 6600 tons—
4050 tons in new projects.**

AWARDS

New York, 140 tons, Madison Avenue bridge approach at Exterior Street and East 138th Street, to Joseph T. Ryerson & Son, Inc., Newark, N. J.

New York, 400 tons, Grand Concourse bridge, to Fireproof Products Co., New York.

Brooklyn, 175 tons, Meeker Avenue bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Weehawken, N. J., 925 tons, approach and ramps, Lincoln tunnel, to Joseph T. Ryerson & Son, Inc., New York.

Jersey City, 100 tons, Tonnelle Avenue bridge, to Joseph T. Ryerson & Son, Inc., New York.

Elizabethport, N. J., 150 tons, Central Railroad of New Jersey building, to Igoe Bros., Newark, N. J.

Mont Alto, Pa., 1600 tons, hospital buildings; 1400 tons to Sweet's Steel Co., Williamsport, Pa.; 200 tons to Bethlehem Steel Co., Bethlehem, Pa.

Philadelphia, 1400 tons, Lit Brothers warehouse, to Bethlehem Steel Co., Bethlehem, Pa.

Millersville, Pa., 125 tons, State Teachers College, to Gilmour Steel Products, Philadelphia.

Port Huron, Mich., 300 tons, International bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Minneapolis, Minn., 200 tons, elevator building, Russel-Miller Milling Co., to Laclede Steel Co., St. Louis.

Mound, Minn., 100 tons, school building, to Trueson Steel Co., Youngstown, Ohio.

Urbana and Champaign, Ill., 125 tons each, armory buildings, to Ceco Steel Products, Omaha, Neb.

Springfield, Ill., 187 tons, domestic science building, to Laclede Steel Co., St. Louis.

Rutledge, Tex., 325 tons, Colorado River project, to Tennessee Coal, Iron & Railroad Co., Birmingham.

Homedale, Idaho, 100 tons, Owyhee project, to Laclede Steel Co., St. Louis.

Sacramento, Cal., 113 tons, buildings at Agricultural Park, to Soule Steel Co., San Francisco.

NEW REINFORCING BAR PROJECTS

New York, 100 tons, World's Fair building for Ford Motor Co.

Baltimore, 1150 tons, Black River sewage disposal plant, Virginia Engineering Co., New- port News, Va., low bidder.

Washington, 300 tons, Doctors' Hospital.

Portsmouth, Va., 878 tons, Norfolk Navy Yard requisition, Virginia Steel Co., Richmond, Va., low bidder.

La Grange, Ky., 500 tons, prison.

Ann Arbor, Mich., 300 tons, hospital.

West Lafayette, Ind., 170 tons, chemical building.

Chicago, 100 tons, Peoples Store, 112th Street.

Martindale, Mont., 200 tons, bridge.

Missoula, Mont., 272 tons, underpass; bids March 30.

Ely, Nev., 125 tons, underpass; W. W. Clyde, Springville, Utah, general contractor.

El Cerrito, Cal., 238 tons, school.

Cody, Wyo., 187 tons, Bureau of Reclamation project (Invitation 48115-A); Laclede Steel Co., St. Louis, low bidder.

Parco, Wyo., 295 tons, Kendrick project; bids opened.

Earp, Cal., 153 tons, Parker Dam (Invitation 44271).

Tacoma, Wash., 220 tons, Hylebos waterway bridge; bids April 12.

RAILROAD BUYING

New Haven has purchased 10 diesel-electric switching locomotives from American Locomotive Co. General Electric Co. will build the electric drive.

Phillips Petroleum Co. has placed an order for 10 tank cars with General American Transportation Corp.

Bangor & Aroostook has applied to Interstate Commerce Commission to assume obligation with respect to \$1,500,000 equipment trust certificates to assist in recent purchases of 500 box cars, 115 steel hopper cars, 50 steel rack cars and one baggage-mail car.

RAILS AND TRACK SUPPLIES

Chicago & Great Western has ordered 3060 tons of rails from Carnegie-Illinois Steel Corp., and 1115 tons from Inland Steel Co.

Western Pacific has released 10,930 tons of rails to Colorado Fuel & Iron Co. against an order for 22,000 tons placed last December.

The Chicago, Milwaukee, St. Paul & Pacific Railroad has been given Interstate Commerce Commission authority to issue \$2,235,000 in equipment trust certificates to aid in the procurement of four passenger locomotives and 464 50-ton steel flat cars estimated to cost \$3,210,922. The locomotives will be built by the American Locomotive Co., and the cars will be constructed by the railroad in its Milwaukee shops.

Taylor Visits Mills For Last Time as U. S. Steel Chairman

MYRON C. TAYLOR, who in recent years has rebuilt the United States Steel Corp., this week made his last inspection as corporation chairman at the organization's mills. He retires April 4.

With Edward L. Stettinius, chairman-elect; Benjamin F. Fairless, president; W. A. Irwin, vice-chairman; E. M. Voorhees, vice-chairman finance committee, and J. Carlisle MacDonald, assistant to the chairman, and other officials, Mr. Taylor visited plants in the Pittsburgh, Chicago, Birmingham and Youngstown areas.

SWOC Reports

122 Unsigned

ONE HUNDRED AND TWENTY-TWO of 514 steel manufacturing, fabricating and processing firms which held SWOC contracts have not yet renewed such agreements or taken action toward renewal. SWOC headquarters at Pittsburgh announce. Twenty-seven contracts were signed this past week.

Seven firms recently signing contracts, according to the SWOC, are the St. Louis Car Co., St. Louis, Mo.; Canton Malleable Iron Co., Canton, Ohio; Acheson Mfg. Co., Rankin, Pa. and Reliance Steel Products, Rankin, Pa.; Rudd Mfg. Co., Pittsburgh; Chicago-Hutchins Corp., Hyde Park, Pa., and the Elliott Co., Jeannette, Pa. National Supply Co., Pittsburgh, has also signed a standard contract with a 20-day escape clause.

Westinghouse Realines Industrial Department

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., has organized three new departments, industrial, resale, and industry engineering, to meet changing conditions in industrial markets. The new industrial department has a staff of field-trained sales engineers. The electrification of industries such as the iron and steel, mining, chemical, petroleum and public works, will be served by this department under management of C. B. Stainback.

The resale department will serve manufacturers whose products incorporate electrical equipment and will be managed by Bernard Lester. The industry engineering department will be directed by C. A. Powell.

Chevrolet Tonawanda Plant Starts Operating

BUFFALO.—The \$12,500,000 Chevrolet motor plant on the River Road in Tonawanda went into production this week on motors and axles and by the end of the month is expected to have engines and axles leaving the lines at the rate of 150 a day. Its capacity is 1200 engines and axles a day. Five hundred men are on the plant payroll now. Capacity operation calls for 3500 men.

FABRICATED STEEL

... Lettings advance to 13,900 from 13,800 tons last week.

... New projects at 24,200 tons compared with 11,950 tons a week ago.

... Plate awards only 575 tons.

NORTH ATLANTIC STATES

AWARDS

Barnet, Vt., 100 tons, bridge, to Pan-American Bridge Co., New Castle, Ind.

Ashland-Bridgewater, N. H., 800 tons, State bridge, to an unnamed bidder.

Rochester, N. H., 600 tons, high school, to Haarman Steel Co., Holyoke, Mass.

Cambridge, Mass., 360 tons, Littauer School building, Harvard University, to New England Structural Co., Everett, Mass.

Worcester, Mass., 650 tons, industrial building, Norton Co., to Eastern Bridge & Structural Co., Worcester, Mass.

New York, 235 tons, power house addition, Bellevue Hospital, to Jones & Laughlin Steel Service Corp., Long Island City.

New York, 1700 tons, railroad transportation building, World's Fair, to American Bridge Co., Pittsburgh.

Salem, N. J., 180 tons, building for H. J. Heinz Co., to Austin Co., Cleveland.

Bala-Cynwyd, Pa., 275 tons, junior high school, to Roy A. Robinson, Philadelphia.

Pittsburgh, 500 tons, addition to Mercy Hospital, to Ingalls Iron Works Co., Birmingham.

Baltimore, 325 tons, National Can Co., warehouse, to Frank M. Weaver & Co., Lansdale, Pa.

Washington, 870 tons, two hangars, Bolling Field, to Lehigh Structural Steel Co., Allentown, Pa.

THE SOUTH

Sc生生 County, Ga., 225 tons, bridge, to Virginia Bridge Co., Roanoke, Va.

Houston, Tex., 1660 tons, City Hall, to Mosher Steel Co., Houston.

CENTRAL STATES

Wyandotte, Mich., 570 tons, turbine room and cell building, Michigan Alkali Co., to Whitehead & Kales Co., Detroit.

River Rouge, Mich., 535 tons, open-hearth furnaces for Ford Motor Co., to Whitehead & Kales Co., Detroit.

Frankenmuth, Mich., 165 tons, Frankenmuth Brewery Co., to Whitehead & Kales Co., Detroit.

Columbus, Ohio, 150 tons, E. Mithoff Nicholas store, to C. E. Morris Co., Columbus.

Fort Wayne, Ind., 400 tons, Catholic high school, to Joseph T. Ryerson & Son, Inc., Chicago.

Winnetka, Ill., 175 tons, addition to boiler house, Otto Randolph Co., to Mississippi Valley Structural Steel Co., St. Louis.

Sheffield, Ill., 165 tons, bridge spans, Rock Island Lines, to Wisconsin Bridge & Iron Co., Milwaukee.

100—THE IRON AGE, March 24, 1938

Washington County, Kan., 270 tons, bridge, to Fort Pitt Bridge Works Co., Pittsburgh.

Owen and Boyd, Wis., 300 tons, State bridges, to Fort Pitt Bridge Works Co., Pittsburgh.

St. Louis, 150 tons, Singer Sewing Machine Co. building, to Mississippi Valley Structural Steel Co., St. Louis.

WESTERN STATES

Golden, Colo., 200 tons, geology building, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

Boulder City, Nev., 100 tons, bus structure for Metropolitan Water District switching station, to American Bridge Co., Denver.

Rudell Station, Cal., 150 tons, underpass, to Ingalls Iron Works Co., Birmingham.

Coram, Cal., 200 tons, warehouse for Bureau of Reclamation, to Worden-Allen Co., Milwaukee.

Grand Coulee Dam, Wash., 1880 tons, gate frames, to Koppers Co., Pittsburgh.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Cambridge, Mass., 100 tons, Harvard University squash court.

Portland, Me., 150 tons, building, International Harvester Co.

Fall River, Mass., 150 tons, bus garage, Eastern Massachusetts Street Railway Co.

New York, 400 tons, Borden Co. building for World's Fair.

New York, 130 tons, World's Fair building for Continental Baking Co.

New York, 600 tons, General Realty & Utilities Corp. building.

Buffalo, 120 tons, bridge across Scajaquada Creek; bids March 24.

Rochester, N. Y., 500 tons, Neisner Bros., Inc., store building; bids March 25.

Scio, N. Y., 200 tons, centralized school; bids April 4.

Orange, N. J., 120 tons, Ballinger Co. building.

Morristown, N. J., 860 tons, State armory.

Paulsboro, N. J., 150 tons, alterations to Socony-Vacuum Oil Co. building.

Mount Gretna, Pa., 500 tons, State prison building; bids close April 15.

Ashley, Pa., 350 tons, addition to coal breaker, Glen Alden Coal Co.

Baltimore, 150 tons, voting machine storage building.

Washington, 180 tons, alterations to Georgia-Randolph building, Chesapeake & Potomac Telephone Co.

THE SOUTH

Lexington, Ky., 220 tons, Montgomery Ward store.

La Grange, Ky., 560 tons, Oldham State prison.

Raleigh, N. C., 400 tons, department store.

Shubuta, Miss., 225 tons, overpass.

CENTRAL STATES

Detroit, 600 tons, City Pattern Works, Inc.; Norman Krecke, architect.

Detroit, tonnage unstated, factory, laboratory and office building, Carboloy Co., Inc., Realty Corp.; Smith, Hinchman & Grylls, architects.

Muskegon, Mich., 300 tons, factory building, Norge Corp.; Smith, Hinchman & Grylls, architects.

Detroit, 400 tons, factory building, Divo Truck Co.; Smith, Hinchman & Grylls, architects.

Columbus, Ohio, 300 tons, building, Frank E. Powell.

Holland, Mich., 130 tons, alterations to H. J. Heinz Co. building.

State of Indiana, 630 tons, bridges; bids March 29.

Chicago, 150 tons, bus storage building, Chicago Surface Lines.

Chicago, 180 tons, Northwestern Yeast Co. building.

Cook County, Ill., 1150 tons, two bridges; bids March 28.

Pacific, Mo., 600 tons, Frisco Railroad bridge.

WESTERN STATES

Charleston, Utah, 400 tons, Deer Creek Dam.

Missoula, Mont., 278 tons, underpass; bids March 30.

Spokane, Wash., 120 tons, warehouse for International Harvester Co.

Cathlamet, Wash., 1200 tons, Puget Island bridge over lower Columbia River; bids April 12. Previously reported as Olympia, Wash., where bids will be taken.

Tacoma, Wash., 542 tons, including machinery, Hylebos waterway bridge; bids April 12.

Grand Coulee Dam, Wash., 5700 tons, trash rack structures; Bethlehem Steel Co. low bidder on bulk of tonnage.

Compton, Cal., 244 tons, Olive Street, Wilmington Boulevard, and Compton Boulevard bridges over Compton Creek for United States Engineer (Proposal 367); bids March 25.

San Bernardino, Cal., 100 tons, Ethyl Gasoline Corp. plant.

Southern Pacific Railroad is taking bids on 12,000 tons for construction of several bridges.

FABRICATED PLATES

AWARDS

Norfolk, Va., 120 tons, hangar doors for Naval Base, to Bristol Steel & Iron Co., Bristol, Va.

Detroit, 355 tons, 700 troughs for Michigan Alkali Co., to M. H. Treadwell Co., Midland, Pa.

San Francisco, 100 tons, welded steel clamshell barge for United States Engineer, to Pacific Coast Engineering Co., Oakland, Cal.

NEW PROJECTS

Chicago, 600 tons, Inland Waterways Corp. barges.

SHEET PILING

AWARDS

Alameda, Cal., 2500 tons, bulkheads and pier for Navy Air Station to Columbia Steel Co., San Francisco.

NEW PROJECTS

Los Angeles, 900 tons, flood control projects for United States Engineer; bids opened.

NON-FERROUS

Domestic prices are unchanged; demand is small.

Export copper market shows signs of new activity.

Prime Western sales increase to 1268 tons.

NEW YORK, March 22.—With the subsiding of the war scare abroad, the attention of producers and consumers in this country is focused again on the domestic situation. Demand here is generally very light and buyers still adhere to the policy of covering only their immediate requirements. Prices are little

changed and on the firm side. Domestic copper sales over the weekend amounted to 1143 tons, bringing the total for the month through Saturday to 10,901 tons. Quotations on electrolytic metal are unchanged at 10c. per lb., Connecticut Valley. Foreign sales of the red metal were in fair volume, averaging about 2000 tons

per day. This morning's foreign market quotation of 9.85c. per lb., c.i.f., usual Continental base ports, is five points below the price of a week ago.

Tin

Business in the early part of the past week was extremely light, but over the week-end, with conditions abroad more settled, domestic interest was revived to a moderate extent and sizable quantities were bought on Friday and Monday. Collapsible tube makers were particularly active. Today, however, very little tin is being sold and the market is again in the doldrums. Today's straits quotation in New York is 41.50c. per lb., 0.25c. below a week ago, and the average price for the week is 41.35c., 15 points below last week's average. On first call in London this morning cash standards were priced at £185 10s., as compared with £186 12s. a week ago.

Zinc

Prime Western sales for the week were 1268 tons; as compared with 768 tons in the previous week. Shipments were 2300 tons, down 400 tons from the preceding period, and undelivered stocks now stand at 32,507 tons. Domestic quotations are unaltered at 4.60c. per lb., New York, while in London this morning prompt spelter was quoted at 3.25c. per lb.

Lead

Sales in the past week were limited to a few carlots for prompt delivery and the week's total was about 50 per cent greater than the unusually small quantity sold in the preceding week. As April needs are only 30 per cent covered, there are substantial tonnages to be bought before the end of next month. Quotations here are firm and unchanged at 4.50c. per lb., New York. On the London exchange this morning 3.71c. was bid for March metal.

Brass and Bronze Ingots

The average prices received by members of the Non-Ferrous Ingot Metal Institute during the 28-day period ended Feb. 18, on 80-10-10 and 85-5-5 per cent metal, were 11.933c. and 10.204c. per lb. respectively. These compare with 12.77c. and 11.04c. in the previous period. Deliveries in February were 2756 tons, 18 tons below January, and undelivered orders on March 1 amounted to 11,935 tons against 12,821 on Feb. 1.

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 16	Mar. 17	Mar. 18	Mar. 19	Mar. 21	Mar. 22
Electrolytic copper, Conn.*	10.00	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.125	10.125	10.125	10.125	10.125	10.125
Straits, tin, spot, New York	41.375	41.375	41.00	41.50	41.50	41.50
Zinc, East St. Louis	4.25	4.25	4.25	4.25	4.25	4.25
Zinc, New York	4.60	4.60	4.60	4.60	4.60	4.60
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Delivered Connecticut Valley; price 1/4c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 15.75c. a lb., prompt, f.o.b. New York.
Antimony, American, 13.75c. per lb., prompt shipment, New York.
Quicksilver, \$73.50 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 10.25c. a lb., less carload, delivered in Middle West
1/4c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig	42.25c. to 43.25c.
Tin, bar	44.25c. to 45.25c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	18.125c.
*High brass sheets	16.375c.
*Seamless brass tubes	19.125c.
*Seamless copper tubes	18.625c.
*Brass rods	12.375c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	11.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.625c. to 7.625c.
Lead, sheets, cut	7.75c.
Antimony, Asiatic	16.00c. to 17.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelt-ing, 98 to 99 per cent	19.50c. to 21.00c.
Solder, 1/2 and 1/2	29.00c. to 31.00c.
Babbitt metal, commercial grade	20.00c. to 50.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig	45.50c.

Tin, bar	47.50c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c.
Zinc, slabs	7.25c. to 7.50c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.25c.
Antimony, Asiatic	18.50c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	49.50c.
Solder, 1/2 and 1/2	26.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c. 8.50c.
Copper, hvy. and wire	7.00c. 7.50c.
Copper, light and bot-toms	6.25c. 6.50c.
Brass, heavy	4.25c. 4.875c.
Brass, light	3.50c. 4.25c.
Hvy. machine com-position	6.75c. 7.25c.
No. 1 yel. brass turn-ings	4.375c. 4.875c.
No. 1 red brass or compos. turnings	6.375c. 6.875c.
Lead, heavy	3.625c. 4.00c.
Cast aluminum	8.75c. 10.00c.
Sheet aluminum	11.50c. 13.00c.
Zinc	2.375c. 3.625c.

IRON AND STEEL SCRAP

... Market is softer at Pittsburgh, and export prices are weaker.

... Composite off 4c. to \$13.54.

March 22.—Because of an offer to buy a small amount of No. 1 steel at \$13.75 a ton, Pittsburgh, the market is softer there in the dullest period in years. Because brokers are still willing to pay \$13.50 for that grade, however, a spread of only 25c. is shown, making the average price \$13.62½. With the price of No. 1 steel unchanged at Philadelphia and Chicago, THE IRON AGE composite figure has declined only 4c. to \$13.54, still 12c. above the 1938 low of \$13.42 recorded on March 8. With no signs of any renewed mill buying, the national market is utterly listless, and most prices are nominally unchanged. The chief activity centers at Buffalo, where a 2000-ton sale was recently made.

Export prices are noticeably softer. All brokers are now in line in New York, paying \$1 less a ton for material delivered to barges than prevailed a few weeks ago. At Boston, buying prices have been reduced 25c. to 50c. a ton, and at Philadelphia a spread of \$1 is shown on the No. 1 grade to indicate that some material is being picked up cheaper than was the case a week ago, although the higher price is being paid in some instances.

Pittsburgh

With little or no unfilled tonnage remaining in the district, this condition reflects the absolute dullness of the local market. In previous depressions, dealers were at least able to move some scrap, but transactions at present are almost at a standstill. One broker who had been paying \$14 a ton for No. 1 steel is out of the market, while a local mill last week offered \$13.75 for a small amount. Meanwhile, dealers are unable to pick up No. 1 steel at less than \$13.50; hence the market this week is quoted with a 25c. spread at \$13.50 to \$13.75 a ton for No. 1 heavy melting.

Chicago

Slightly higher mill operations have not influenced scrap activity, as district

producers have sufficient old material on hand and on order to meet their current needs. Trading volume is low, and quotations are unchanged and nominal. No. 1 steel is listed at \$12 to \$12.50.

Philadelphia

Export shipments against old contracts constitute the only sign of activity in this district. One boatload is slated to leave port today (Tuesday), another with 2000 tons is scheduled to leave Wednesday, and one with 5000 tons for Germany is expected to clear port before the end of the week. No mill sales have been reported since the sale last week of No. 1 heavy melting at \$15, delivered; consequently, domestic quotations are unchanged.

Cleveland

The prolonged period of inactivity in iron and steel scrap shows no sign of a sudden ending. Consumption by open hearths continues at a slow rate, and, even if operations should break over the 35 per cent mark, it is doubtful if mill buying would materialize immediately. Dealers are doing a little buying of choice material for their yards, but in general are well stocked and see no need for heavier commitments at this time. Other districts in the Middle West have noted some activity in the lighter grades recently, since fast charging is not so important, but the activity has not yet been reflected here. No. 1 heavy melting remains at \$12.50 to \$13 at Youngstown, and \$11.50 to \$12 at Cleveland.

Buffalo

Recent transactions and inquiries indicate that the market generally is not weaker. Information is out about a recent 2000-ton sale of heavy melting steel and allied grades on the basis of \$13 for No. 1 and \$11 for No. 2. Very little No. 1 is said to have been involved. This sale was made to a mill which has been buying steadily, but had recently been out of the market. Another sale to another mill of approximately 500 tons of No. 1 heavy melting steel at \$13 is noted. An inquiry is out for 500 to 1000 tons of No. 2 steel. This tonnage may be purchased before the end of this week, and it is believed that it can be bought at \$11 to \$11.50.

St. Louis

A district melter bought 2000 tons of No. 2 heavy melting steel at \$11.50 from several St. Louis dealers for delivery over the next 60 days. No other deals are pending. Prices are unchanged. The Missouri-Kansas Texas Railway has a list of 300 to 400 tons of scrap iron.

Cincinnati

The scrap market is noticeably dull. New business is infrequent and, except for a slight movement of sheet clippings, consumer interest is nil. Dealers refuse offerings except at good prices or for urgent application to contracts.

Detroit

Softness in dealers' prices accompanied this week's continued lack of activity in the Detroit market. A downward price trend for some weeks to come seems likely. Only in foundry items is the tone strong enough to maintain present levels during the spring, although even here the volume of foundry business for new die work has not yet come up to expectations.

New York

After maintaining former prices for export material for several weeks, though other exporters had lowered their buying prices \$1, a leading broker came down into line this week, making the going price \$12.50 for No. 1 and \$11 for No. 2, delivered barges. A recent order for No. 1 at \$15 f.a.s. left little margin of profit at the old figure, considering demurrage and towing charges for barges. While such a figure is considered low today, it is high compared with a sale of No. 1 steel made in 1931 to Italy at \$7.25, delivered, when domestic mill operations were also hovering around 30 per cent of capacity. In that year, significantly, only 136,000 tons of scrap was exported from this country, as compared with close to 4,000,000 tons last year.

Boston

Exporters have reduced prices on Nos. 1 and 2 steel 25c. to 50c. a ton, and are confining activities to a tonnage for Italy. The outlook for further foreign buying is quite uncertain. One unconfirmed report is that the next orders placed will be at prices 10 per cent lower than paid for the Italian tonnage. There is not enough doing in the domestic market to test prices, consequently they are purely nominal. The American Steel & Wire Co. furnaces at Worcester are still out, and the company has not released shipping instructions on old scrap orders, so just when operations will be resumed is problematical. The Washburn Wire Co. rolling mill at Phillipsdale, R. I., is going, but furnaces are still out.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$13.50 to \$13.75
Railroad hvy. mltng.	14.50 to 15.00
No. 2 hvy. mltng. steel	12.00 to 12.50
Scrap rails	15.00 to 15.50
Rails 3 ft. and under	17.50 to 18.00
Comp. sheet steel	13.50 to 13.75
Hand bundled sheets	12.00 to 12.50
Hvy. steel axle turn.	11.50 to 12.00
Machine shop turn.	7.50 to 8.00
Short shov. turn.	7.50 to 8.00
Mixed bor. & turn.	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	14.50 to 15.00
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	15.00 to 15.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet crops	18.00 to 18.50
Low phos. sh. bars	17.50 to 18.00
Low phos. punchings	17.00 to 17.50
Low phos. plate, hvy.	17.00 to 17.50
Low phos. plate clips	15.00 to 15.50
Steel car axles	17.00 to 17.50

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$14.50 to \$15.00
No. 2 hvy. mltng. steel	13.00 to 13.50
Hydraulic bund.	14.50 to 15.00
Hydraulic bund., old.	10.00 to 10.50
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50 to 16.00
Hvy. breakable cast	14.00 to 14.50
No. 1 cast	15.50 to 16.00
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	15.00 to 15.50
Machine shop turn.	6.50 to 7.00
No. 1 blast furnace	6.00 to 6.50
Cast borings	6.00 to 6.50
Heavy axle turnings	10.50 to 11.00
No. 1 low phos. hvy.	17.50 to 18.00
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	19.00 to 19.50
Shafting	19.00 to 19.50
No. 1 RR. wrought	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	12.50 to 13.00

CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel	\$12.00 to \$12.50
Auto. hvy. mltng. steel	
alloy free	10.50 to 11.00
No. 2 auto. steel	10.00 to 10.50
Shoveling steel	12.00 to 12.50
Hydraul. comp. sheets	11.00 to 11.50
Drop forge flashings	9.75 to 10.25
No. 1 busheling	10.75 to 11.25
No. 2 busheling, old	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	16.00 to 17.00
Railroad leaf springs	15.50 to 16.00
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	11.50 to 12.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	11.50 to 12.00
Low phos. punchings	15.50 to 16.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	5.50 to 6.00
Short shov. turnings	7.25 to 7.75
Machine shop turn.	5.00 to 5.50
Reroiling rails	15.25 to 15.75
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	13.75 to 14.25
Railroad malleable	13.25 to 13.75
Agric. malleable	12.00 to 12.50
Per Net Ton	
Iron car axles	\$18.00 to \$18.50
Steel car axles	16.50 to 17.00
No. 1 RR. wrought	9.50 to 10.00
No. 2 RR. wrought	10.75 to 11.25
Locomotive tires	15.75 to 16.25
Pipes and flues	9.25 to 9.75
No. 1 machinery cast.	11.50 to 12.00
Clean auto. cast.	11.25 to 11.75
No. 1 railroad cast	10.75 to 11.25
No. 1 agric. cast	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes	8.00 to 8.50

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$12.50 to \$13.00
Hydraulic bundles	12.00 to 12.50
Machine shop turn.	9.00 to 9.50

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel	\$11.50 to \$12.00
No. 2 hvy. mltng. steel	10.50 to 11.00
Comp. sheet steel	11.00 to 11.50
Light bund. stampings	8.00 to 8.50
Drop forge flashings	10.50 to 11.00
Machine shop turn.	7.00 to 7.50
Short shov. turn.	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
Steel axle turnings	9.50 to 10.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	7.50 to 8.00
Mixed bor. & turn.	7.50 to 8.00
No. 2 busheling	7.50 to 8.00
No. 1 cast	15.50 to 16.00
Railroad grate bars	7.50 to 8.00
Stove plate	7.50 to 8.00
Rails under 3 ft.	17.00 to 17.50
Rails for rolling	15.50 to 16.00
Railroad malleable	15.50 to 16.00
Cast iron carwheels	14.50 to 15.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel	\$12.50 to \$13.00
No. 2 hvy. mltng. steel	10.50 to 11.00
Scrap rails	14.50 to 15.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles	9.50 to 10.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. axle turnings	10.50 to 11.00
Machine shop turn.	6.00 to 6.50
Knuckles & couplers	16.00 to 16.50
Coll & leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	17.00 to 17.50
Shov. turnings	8.00 to 8.50
Mixed bor. & turn.	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Steel car axles	16.00 to 16.50
No. 1 machinery cast.	15.00 to 15.50
Stove plate	11.50 to 12.00
Steel rails under 3 ft.	17.50 to 18.00
Cast iron carwheels	14.00 to 14.50
Railroad malleable	14.00 to 14.50
Chemical borings	10.00 to 10.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:	
Selected hvy. melting	\$12.00 to \$12.50
No. 1 hvy. melting	12.00 to 12.50
No. 2 hvy. melting	11.00 to 11.50
No. 1 locomotive tires	12.50 to 13.00
Misc. stand. sec. rails	13.00 to 13.50
Railroad springs	15.00 to 15.50
Bundled sheets	10.00 to 10.50
No. 1 busheling	7.00 to 7.50
Cast bor. & turn.	5.50 to 6.00
Rails for rolling	14.00 to 14.50
Machine shop turn.	5.00 to 5.50
Heavy turnings	8.50 to 9.00
Steel car axles	19.50 to 20.00
Iron car axles	21.50 to 22.00
No. 1 RR. wrought	8.00 to 8.50
No. 2 RR. wrought	12.00 to 12.50
Steel rails under 3 ft.	14.50 to 15.00
Steel angle bars	13.50 to 14.00
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	12.00 to 12.50
Railroad malleable	13.00 to 13.50
No. 1 railroad cast	11.50 to 12.00
Stove plate	9.00 to 9.50
Agric. malleable	10.00 to 10.50
Grate bars	9.50 to 10.00
Brake shoes	9.00 to 9.50

CINCINNATI

Dealers' buying prices per gross ton at yards:	
No. 1 hvy. mltng. steel	\$9.00 to \$9.50
No. 2 hvy. mltng. steel	7.00 to 7.50
Scrap rails for mltng.	14.00 to 14.50
Loose sheet clippings	5.00 to 5.50
Hydraul. b'ndled sheets	8.50 to 9.00
Cast iron borings	3.00 to 3.50
Machine shop turn.	3.50 to 4.00
No. 1 busheling	7.50 to 8.00
No. 2 busheling	2.50 to 3.00
Rails for rolling	16.00 to 16.50
No. 1 locomotive tires	12.50 to 13.00
Short rails	16.50 to 17.00
Cast iron carwheels	11.00 to 11.50
No. 1 machinery cast	10.50 to 11.00
No. 1 railroad cast	9.00 to 9.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agric. malleable	10.00 to 10.50
Railroad malleable	12.00 to 12.50
Mixed hvy. cast	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$11.50 to \$12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$7.50 to \$8.00
No. 2 hvy. mltng. steel	6.50 to 7.00
Borings and turnings	4.00 to 4.50
Long turnings	3.75 to 4.25
Short shov. turnings	4.50 to 5.00
No. 1 machinery cast	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast	10.50 to 10.50
Hydraul. comp. sheets	9.25 to 9.75
Stove plate	7.25 to 7.75
New factory bushel	7.25 to 7.75
Old No. 2 busheling	3.75 to 4.25
Sheet clippings	5.50 to 6.00
Flashings	7.25 to 7.75
Low phos. plate scrap	9.00 to 9.50

NEW YORK

Dealers' buying prices per gross ton on cars:	
No. 1 hvy. mltng. steel	\$11.00 to \$11.50
No. 2 hvy. mltng. steel	9.50 to 10.00
Hvy. breakable cast	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	16.00 to 16.50
No. 1 RR. wrought	11.50 to 12.00
No. 1 wrought long	10.00 to 10.50
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	3.50 to 4.00
Cast borings*	3.50 to 4.00
No. 1 blast furnace	3.50 to 4.00
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	7.50 to 8.00
Light iron	4.00 to 4.50

*\$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel	\$13.30 to \$13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	9.75
Machine shop turn.	2.40
M	

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton

Rerolling \$37.00
Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer \$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared 2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton

F.o.b. Pittsburgh or Cleveland \$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind. 48.00

F.o.b. Worcester, Mass. 49.00
F.o.b. Birmingham 50.00

F.o.b. San Francisco 56.00
F.o.b. Galveston 53.00

Rods over 9/32 in. or 47/64 in., inclusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.

F.o.b. Pittsburgh 2.45c.
F.o.b. Chicago or Gary 2.50c.

F.o.b. Duluth 2.60c.

Del'd Detroit 2.60c.

F.o.b. Cleveland 2.50c.

F.o.b. Buffalo 2.55c.

Del'd Philadelphia 2.75c.

Del'd New York 2.79c.

F.o.b. Birmingham 2.60c.

F.o.b. cars dock Gulf ports 2.85c.

F.o.b. cars Pacific ports 3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.30c.

F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.35c.

F.o.b. Buffalo 2.40c.

F.o.b. Birmingham 2.45c.

F.o.b. cars dock Gulf ports 2.70c.

F.o.b. cars dock Pacific ports 2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.45c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.50c.

Del'd Detroit 2.60c.

F.o.b. cars dock Gulf ports 2.85c.

F.o.b. cars dock Pacific ports 2.95c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.30c.

F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.35c.

F.o.b. cars dock Gulf ports 2.70c.

F.o.b. cars dock Pacific ports 2.80c.

Iron

F.o.b. Chicago 2.40c.

F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.

F.o.b. Pittsburgh 2.90c.

F.o.b. Cleveland, Chicago and Gary 2.95c.

F.o.b. Buffalo 3.00c.

F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 18,999 lb.

Plates

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago or Gary 2.30c.

Del'd Cleveland 2.445c.

F.o.b. Coatesville or Spar. Pt. 2.35c.

Del'd Philadelphia 2.44c.

Del'd New York 2.54c.

F.o.b. Birmingham 2.40c.
F.o.b. cars dock Gulf ports 2.65c.
F.o.b. cars dock Pacific ports 2.80c.
Wrought iron plates, f.o.b. Pittsburgh 3.80c.

Floor Plates

F.o.b. Pittsburgh 3.50c.

F.o.b. Chicago 3.55c.

F.o.b. Coatesville 3.60c.

F.o.b. cars dock Gulf ports 3.90c.

F.o.b. cars dock Pacific ports 4.05c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh 2.25c.

F.o.b. Chicago 2.30c.

Del'd Cleveland 2.445c.

F.o.b. Buffalo or Bethlehem 2.35c.

Del'd Philadelphia 2.465c.

Del'd New York 2.5125c.

F.o.b. Birmingham (standard) 2.40c.

F.o.b. cars dock Gulf ports 2.69c.

F.o.b. cars dock Pacific ports 2.80c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh 2.60c.

F.o.b. Chicago or Buffalo 2.70c.

F.o.b. cars dock Gulf or Pacific Coast ports05c.

F.o.b. cars dock Pacific ports05c.

F.o.b. Birmingham 2.80c.

F.o.b. Granite City 2.80c.

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WIRE PRODUCTS
(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	.29c.
Galvanized wire	.29c.
Spring wire	.35c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$3 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

To the Trade

	Base per Keg
Standard wire nails	\$2.75
Smooth coated nails	2.75
Cut nails, carloads	3.60

Base per 100 Lb.

Annealed fence wire	\$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbed wire	3.40
Woven wire fence, base column	.75
Single loop bale ties, base col.	.63
Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are \$3 a ton over Pittsburgh.	

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

	Steel	Wrought Iron
In.	Black	Galv.
1/8	.52	31
1/4 to .55	38 1/2	1/4 & 3/8 +13 +35
1/2	.59 1/2	49
3/4	.62 1/2	53
1 to 3	.64 1/2	55%

Lap Weld

2	57	47 1/2	2	26 1/2	10
2 1/2 & 3	60	50 1/2	2 1/2 to 3 1/2	27 1/2	12 1/2
3 1/2 to 6	62	52 1/2	4	29 1/2	16
7 & 8	61	50 1/2	4 1/2 to 8	28 1/2	15
9 & 10	60 1/2	50	9 to 12	24 1/2	10
11 & 12	59 1/2	49			

Butt Weld, extra strong, plain ends	
1/8	.50 1/2
1/4 to 3/8	40 1/2
1/2	.57 1/2
3/4	.61 1/2
1 to 3	63

Lap Weld, extra strong, plain ends	
2	.55
2 1/2 & 3	59 1/2
3 1/2 to 6	62 1/2
7 & 8	61 1/2
9 & 10	60 1/2
11 & 12	59 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes (Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold	Hot
1 in. o.d.	13 B.W.G.	\$ 9.46
1 1/2 in. o.d.	13 B.W.G.	11.21
2 in. o.d.	13 B.W.G.	12.38
2 1/2 in. o.d.	13 B.W.G.	14.09
3 in. o.d.	13 B.W.G.	15.78
3 1/2 in. o.d.	13 B.W.G.	17.60
4 in. o.d.	12 B.W.G.	19.37
4 1/2 in. o.d.	12 B.W.G.	21.22
5 in. o.d.	12 B.W.G.	22.49
5 1/2 in. o.d.	12 B.W.G.	23.60
6 in. o.d.	11 B.W.G.	45.19
6 1/2 in. o.d.	11 B.W.G.	29.79
7 in. o.d.	10 B.W.G.	36.96
7 1/2 in. o.d.	9 B.W.G.	56.71
8 in. o.d.	7 B.W.G.	87.07
8 1/2 in. o.d.		77.95
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IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

Base per Lb.

Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs \$3.65
<i>Per Cent Off List</i>	
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	55
Carriage bolts, 100 count	55
Nuts, all styles, 100 count	55
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'l'd, base per 100 lb.	\$3.30
Wire, galv. soft, base per 100 lb.	\$3.70
Common wire nails, per keg	\$2.90
Cement coated nails, per keg	\$2.90

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO

Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	\$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
<i>Per Cent Off List</i>	
Machine bolts and carriage bolts, 1/2 in. and smaller	60
Lag screws	**55 and 5
Hot-pressed nuts, sq. and hex, tap or blank, 1/4 by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Cm. wfre nails, 15 kegs or more, per keg	\$3.20
Cement c't'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

Base per Lb.

Plates, 1/4 in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. char-coal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled: strip, soft and quarter hard	3.92c.

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Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.75c.
Galvanized sheets (No. 24*)	5.25c.
Long terne sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armco iron, hot-rolled annealed (No. 24†)	6.65c.
Toncan iron, hot-rolled annealed (No. 24†)	6.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.20c.
Deep drawing	5.85c.
Stretcher leveled	5.85c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, 1/2 in. and heavier	5.60c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Tire steel, 1 x 1/2 in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per kg in 25 kg lots	\$3.25

<i>Per Cent Off List</i>	
Machine bolts, square head and nut: All diameters.	Prices on application
Carriage bolts, cut thread: All diameters.	Prices on application
<i>Per Cent Off List</i>	
* For 1500 lb. or more; add 0.25c. on smaller lots. No. 28 and lighter, 36 in. wide, 20c. per 100 lb. higher.	

ST. LOUIS

Base per Lb.

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	5.29c.
Boiler rivets	5.39c.

<i>Per Cent Off List</i>	
Tank rivets, 7/16 in. and smaller	50
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities	60
<i>Per Cent Off List</i>	
* No. 26 and lighter take special prices.	

PHILADELPHIA

Base per Lb.

Plates, 1/4-in. and heavier	3.90c.
Structural shapes	3.90c.
Soft steel bars, small shapes, iron bars (except bands)	4.00c.
Reinfor. steel bars, square and deformed	3.53c.
Cold-finished steel bars	4.53c.
Steel hoops	4.35c.
Steel bands, No. 12 and 3/16 in. incl.	4.10c.
Spring steel	5.50c.
Hot-rolled anneal. sheets (No. 24)	4.65c.
Galvanized sheets (No. 24)	5.30c.
Hot-rolled annealed sheets (No. 10)	4.00c.
Diam. pat. floor plates, 1/4 in.	5.25c.

These prices are for delivery in Philadelphia trucking area.
* Base prices subject to deduction on orders aggregating 4000 lb. or over.
† For 25 bundles or over.
‡ For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.

Reinfor. steel bars	2.50c.
Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
Black ann'l'd wire, per 100 lb.	\$3.40
* No. 9 galv. wire, per 100 lb.	3.80
* Com. wire nails, base per keg.	2.95

Per Cent Off List
Machine and carriage bolts, small
 Large 65 and 5
 60 and 10
Nuts, 100 count
 1/2 in. and smaller 65 and 5
 9/16 in. to 1 in. 60 and 10

† Outside delivery 10c. less.

* For 5000 lb. or less.

‡ Plus switching and carriage charges and quantity differentials up to 50c.

CINCINNATI

Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinfor. bars	3.75
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb.	\$3.48
(1000 lb. or over)	
Com. wire nails, base per keg:	
Any quantity less than carload.	3.20
Cement c't'd nails, base 100-lb. keg.	3.50
Chain, lin. per 100 lb.	8.35

Net per 100 Ft.

Seamless steel boiler tubes	
2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes	
2-in.	20-73
4-in.	48.41

BUFFALO

Base per Lb.

Plates	3.92c.
Floor plates	5.52c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.00c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in. to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.35c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	\$3.26
Black wire, base per 100 lb.	
(2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

Base per Lb.

Channels, angles	4.20c.
Tees and zees, under 3 in.	4.45c.
H beams and shapes	4.07c.
Plates—Sheared, tank and univ. mill, 1/4 thick and heavier	4.08c.
Floor plates, diamond pattern	5.13c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets	
No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 2	

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.55c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)**	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb., base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

**In Detroit only, 1500 to 3749 lb., base less .025c.; 3750 to 7499 lb., base less .040c.; 7500 lb. and over, base less .060c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	5.16c.
Boiler rivets, cone head (keg lots)	5.26c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	3.85c.
Com. wire nails and cement coated nails 100 to 4999 lb.	3.30c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller or shorter	65
Larger and longer up to 1 in., diam.	60-5
1 1/2 in. and larger	60
Coach and lag screws	60-5
Hot-pressed nuts, sq. and hex. tapped or blank, 1-199 lb.	50
200 lb. and over:	
1/2 in. and smaller	62 1/2
9/16 to 1 in.	60
1 1/2 in. and over	50-10

Prices given above are delivered Milwaukee.
On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.77c.
Hot-rolled annealed sheets No. 24	4.75c.
Galvanized sheets, No. 24	5.25c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes	\$3.85 base
Structural shapes and plates	3.75 "
Hot rolled sheets No. 10 ga.	3.80 "
Hot rolled sheets No. 24 ga.	4.40 " 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05 " 3500 lb. or more
Strip	4.05 "
Reinforcing bars	3.85 "
Floor plates	5.96 "
Cold finished bars	4.91 "
Machine and carriage bolts	50 & 10 off list
Rivets (structural)	\$4.60 base

On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bds. or more	4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants. For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	4.21c.
Iron bars	4.21c.
Reinforcing bars	4.21c.
Reinforcing shapes	4.11c.
Plates	4.11c.
Hot-rolled sheets No. 10	4.16c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24	4.66c.
Steel bands	4.41c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per kg	\$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb.
Plates, tank and U. M.	4.05c. 4.30c. 4.25c.
Shapes, standard	4.05c. 4.30c. 4.25c.
Soft steel bars	4.20c. 4.30c. 4.45c.
Reinforcing bars, f.o.b. cars dock	Pacific ports 2.975c. 2.975c. 2.975c.
Hot-rolled annealed sheets (No. 24)	5.15c. 5.05c. 5.35c.
Hot-rolled sheets (No. 10)	4.30c. 4.50c. 4.50c.
Galv. sheets (No. 24 and lighter)	5.85c. 5.25c. 5.90c.
Galv. sheets (No. 22 and heavier)	6.10c. 5.45c. 5.90c.
Cold-finished steel	Rounds 6.80c. 6.85c. 7.10c.
Squares and hexagons	8.05c. 8.10c. 7.10c.
Flats	8.55c. 8.60c. 8.10c.
Common wire nails—base per kg less carolad	\$3.40 \$3.20 \$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.27
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.75
F.o.b. Birmingham	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.

Gray Forge

Valley or Pittsburgh furnace

Charcoal

Lake Superior furnace

Delivered Chicago

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)

\$102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%

\$33.00

F.o.b. New Orleans

33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)

\$69.50*

50% (ton lots in 50 gal. bbl.)

80.50*

75% (carload lots, bulk)

126.00*

75% (ton lots in 50 gal. bbl.)

139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%

\$33.50

For each additional 0.50% silicon up to 17%, 50c. per ton is added.

Manganese 2 to 3%, \$1 per ton additional. For each unit of manganese over 3%, \$1 per ton additional. Phosphorus 0.75% or over, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%

\$27.50

For each additional 0.5% silicon up to 17%, 50c. per ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally

\$2.00

Ferrotungsten, lots of 500 lbs., nominally

2.05

Ferrotungsten, smaller lots, nominally

2.10

Ferrovanadium, contract, per lb. contained V, delivered

\$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots

\$2.25†

Ferrocobaltititanium, 15 to 18%

Ti, 7 to 8% C, f.o.b. furnace

carload and contract per net ton

\$142.50

Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton

\$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton

\$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24% per gross ton, \$3 unitage, freight equalized with Nashville

\$75.00

Ferromolybdenum, per lb. Mo. f.o.b. furnace

95c.

Calcium molybdate, per lb. Mo. f.o.b. furnace

80c.

*Spot prices are \$5 per ton higher.

†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports
Per Gross Ton

Old range, Bessemer	51.50%	\$5.25
Old range, non-Bessemer	51.50%	5.10
Mesabi, Bessemer	51.50%	5.10
Mesabi, non-Bessemer	51.50%	4.95
High phosphorus	51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore
Per Unit

Iron, low phos., copper free, 55 to 58% dry	Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68 1/2% iron	Nominally 17 to 18c.	18c.
Iron, basic or foundry, Swedish, aver.	65% iron, Nominally 15c.	15c.
Iron, basic or foundry, Russian, aver.	65% iron, Nominally 15c.	15c.
Man., Caucasian, washed 52%	52%	45c.
Man., African, Indian, 44-48%	44-48%	40c.
Man., African, Indian, 49-51%	49-51%	Nominal
Man., Brazilian, 46 to 48 1/2%	46 to 48 1/2%	Nominally 40c.
Per Short Ton Unit		
Tungsten, Chinese, Wolframite, duty paid, delivered		\$24.00
Tungsten, domestic, scheelite delivered		\$22.00 to \$25.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton:		
South African (low grade)		\$16.00
Rhodesian, 45%		22.00
Rhodesian, 48%		25.50
Turkish, 48-49%		25.00 to \$26.00
Turkish, 45-46%		23.50 to 24.00
Turkish, 44%		19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:		
50%		\$25.50 to \$26.50
48-49%		25.50 to 26.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$18.00 to \$19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/4% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.75c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	4.75c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd, No. 4 industrial	5.625c.
Del'd Cleve'd, No. 5 industrial	4.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connells-ville, Prompt	\$4.00 to \$4.25
Furnace, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Smaller shops join with big automotive plants in buying machinery in Detroit area.

• • •

... Orders are lagging behind recent high volume of inquiries, as national policies await clarification.

• • •

... Large volume of outstanding live quotations point to active spring.

Tool and Parts Plants Follow Automotive Lead

DETROIT—Continued increased machine tool activity is being felt in this market area, with tooling for 1939 models off to a good start. Chrysler, however, is an exception, and so far has failed to get its plans formulated completely enough to keep pace with other leaders. City Pattern Works, Inc., announcing an expansion that will quadruple its space, plans to add equipment in its pattern and machine shop and non-ferrous foundry. Carboloy Co., Inc., centralizing activity from three plants (Cleveland, Stamford, Conn., and Detroit) will erect new buildings on a 40-acre tract north of Detroit. A retooling program has been launched by Mallory Electric Corp., manufacturers of ignition parts and a newly introduced carburetor. This activity is expected to extend through the next month.

Plenty of Quotations Out, But Orders Are Scarce

NEW YORK—both orders and inquiries have fallen off materially in the past week, but prospects for future business are still bright. During the past month, a large number of quotations have been made, many of which will materialize into orders before very long. This is particularly true of equipment inquired for by a number of arsenals in the East, and for the machinery needed for Naval torpedo station at Alexandria, Va. Meanwhile, new orders have been reduced to a mere trickle for small miscellaneous items. General industrial plants, including machinery and electrical manufacturers, are conspicuously absent from the market. Apparently their re-entry into a buying phase of activity will depend upon a pick-up in their operations and a restoration of national confidence.

Management moves cautiously on production. Schedules are shrinking weekly as backlogs diminish. Average operations are now about 25 per cent, with some plants under this. Stock tools are not large since tax provisions on inventory hold anticipatory production down.

Scattered Orders Point to Irregular Improvement

CLEVELAND—The domestic machine tool business shows scattered and irregular improvement. Operations of some stamping shops and smaller manufacturing concerns have increased recently, but very few of the companies are inclined to specify new equipment. The diversification of orders is encouraging to manufacturers.

Partially counterbalancing the better feeling has been the decision of one or two large Ohio industrial concerns within the last two or three weeks to hold back on equipment programs which they had intended to release. Outside of manufacturers working on presses and other equipment for Ford Motor Co., other automotive work actually in Ohio shops at present is light. Export demand continues less active than at the first of the year.

Orders Lag Behind Inquiries At Pittsburgh

PITTSBURGH—Machine tool inquiries are about on a par with a week ago. However, there is a noticeable lag before some of them turn into firm contracts. New orders during the past week were not numerous, and the outlook for improvement in the near future is still somewhat clouded by business conditions. Revision or elimination of the surplus profit tax coupled with at least a clear cut declaration of policy by the Administration, might go a long way towards enlivening the domestic machine tool business. It is almost certain that high labor costs plus heavy taxes will force many customers during this year to increase their purchases of machine tools for replacement purposes in order to continue in a competitive position.

Demand Spotty, Outlook Fair At Tool Center

CINCINNATI—The machinery market lacked uniformity the past week, as demand turned spotty. An automobile manufacturer bought one crankshaft lathe and other domestic users displayed evident interest in smaller lathes, with one undisclosed order involving in excess of two units. In fact, lathe demand was about equal to an average normal week. Milling and grinder manufacturers indicate fair bookings while drills were without any demand, and heavy tools were relatively inactive. On the whole manufacturers are still optimistic toward late spring improvement, but feel this will be contingent on national policies. The potential ordering is still broad if the present moderately brisk inquiry has any sincere basis. Of course, the trade has a large volume of quotations still outstanding which recent check-backs indicate are still alive and waiting for shop appropriations to become orders.

Bridgeport Mill to Be Ready in Summer

BRIDGEPORT BRASS CO., Bridgeport, Conn., expects its new \$4,000,000 non-ferrous rolling mill to be operating by mid-summer. It will produce all of the copper base alloys in sheet form.

Smooth, continuous flow of metals through all stages from ingots to finished material, automatic devices for handling to insure utmost speed and economy, similar to the straightline principle of production in steel and other industries, are features of the mill, according to Bridgeport Brass officials.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Continental Can Co., Inc., 100 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for one-story addition to branch plant at New Orleans, partly for storage and distribution. Cost over \$75,000 with equipment. Favrot & Reed, Nola Building, New Orleans, are architects.

United States Engineer Office, New York District, Army Building, New York, asks bids until March 29 for six cast steel ball joints and six cast steel retaining rings for dredges Atlanta, Raritan and Navesink (Circular 163).

Carbide & Carbon Chemicals Corp., 30 East Forty-second Street, New York, has acquired close to 200 acres at Texas City, Tex., for new branch plant, to include power house, pumping station, machine shop and other mechanical departments. Work is scheduled to begin soon. Cost about \$3,500,000 with equipment. Other units will be built later.

United States Rubber Products, Inc., Broadway and Fifty-eighth Street, New York, has let general contract to Batson-Cook Co., West Point, Ga., for one-story addition to mill at Hogansville, Ga., in part for storage and distribution. Cost close to \$50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 1 for about 180,000 lb. of forged steel liners (Schedule 3115); until April 5, upper and lower roller tracks and parts (Schedule 3122) for Brooklyn and Philadelphia Navy yards; 5000 gasket-type thermocouples (Schedule 3099) for Philadelphia yard; until April 1, 62 power-driven fuel pumps (Schedule 3073) for Philadelphia and Paterson, N. J.

Safe Fuel Corporation, Long Island City, New York, has leased building at 42-29 Tenth Street, for new plant for processing fuel oils.

Cities Service Oil Co., 70 Pine Street, New York, has approved plans for expansion and improvements in oil refineries at Petty's Island, Philadelphia; East Braintree, Mass.; and East Chicago, Ind. At first noted plant new equipment will be installed for gasoline production, as well as for other petroleum products, to increase capacity about 50 per cent; at East Braintree refinery work will include installation of a new stabilization and propane gas recovery plant and other equipment; a new stabilization and polymerization plant will be installed at East Chicago refinery to increase present output about 10 per cent. Entire project will cost about \$1,500,000.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until April 1 for 7000 ft. of cable and seven reels (Circular 153); until April 12 for dial frame assemblies, coil assemblies, transformer assemblies, thermostats, mountings, plugs, transformers and other equipment (Circular 166).

Korrol Mfg. Co., 232 Greenwich Street, New York, manufacturer of metal products and operating general machine works, has leased four floors in building at 350-54 Greenwich Street, for expansion and will remove to new location and increase capacity.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until March 28 for 160,000 aluminum blocks (Circular 734); until April 7 for 220,000 metal parts for fuses (Circular 756).

E. I. duPont de Nemours & Co., Inc., duPont Building, Wilmington, Del., has authorized a fund of \$33,200,000 for expansion and improvements in chemical and other plants in different parts of country, including new production units and equipment. Over \$7,000,000 of this fund will be used by Cellophane division for new plant near Clinton,

Iowa, on which work is scheduled to begin soon.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until March 29 for aluminum and aluminum alloy washers (Req. 996 Aero), one engine overhaul universal stand and three mounting plates (Req. 10½ Aero).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 28 for three high-speed milling attachments (Circular 804); until March 29 for 200,000 lb. of lead antimony alloy and reworking 100,000 lb. of bullets, etc., into 100,000 lb. of lead antimony alloy (Circular 787); until March 30, two motor-driven floor-type notching machines (Circular 803), 95 items of wheels, with 36 wheels in each item, manufactured with special aluminous oxide grit (Circular 796).

◀ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 29 for 173 engine-driven fuel pumps (Schedule 3097) for East Hartford, Conn., and Philadelphia; until April 1, nickel-copper alloy tubing (Schedule 3092), 850 steel blank shells (Schedule 3055); until April 5, 300 steel shells and 800 phosphor bronze shells (Schedule 3109) for Newport, R. I., Naval Air Station; thrust bearings for turbines (Schedule 3119), chain hoists (Schedule 3096) for Boston, Charleston and Puget Sound Navy yards.

Watson Centrifugal Cotton Gin Co., Bridgeport, Conn., recently organized with capital of \$50,000 by Frank Watson, Jonesboro, Ark., to manufacture a new type of cotton gin, using centrifugal force instead of customary saw teeth for cotton separation, will occupy part of plant of Jenkins Brothers, Main Street, Bridgeport, manufacturer of valves, etc., for initial production, including parts manufacture and assembling.

Pneumatic Drop Hammer Co., 123 Heath Street, Roxbury, Boston, has let general contract to Clark & Smith, Inc., 1372 Hancock Street, Quincy, Mass., for one and two-story and basement addition, 50 x 140 ft. Cost close to \$50,000 with equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 29 for two 3-ton each ball-bearing chain hoists, spur-gearied, with 22-ft. chain (Circular 177).

M-B Mfg. Co., recently organized by members of Mettler Machine Co., 132 Lawrence Street, New Haven, Conn., manufacturer of special machinery, has purchased a building at 1060 State Street, for manufacture of metal products.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until March 29 for one steam pump (Circular 398-106); until April 4 for rail shop and locomotive equipment, air brake equipment parts, engine parts, motor parts, pump parts, etc. (Circular 398-115).

Interocean Dirigible Corp., Richmond, Va. Garrett W. Peck, vice-president, is arranging for a stock issue of 1,250,000 shares, valued at \$16,250,000, to be used in part for erection of plant at or near Richmond for production of all-metal dirigibles and new design, with engine units and propellers in tandem in long tube running from end to end of ship. Other parts of fund will be used for development of new aircraft and general operations.

General Purchasing Officer, Panama Canal, Washington, asks bids until April 4 for 205,000 ft. of rubber insulated wire, 5000 ft. of rubber insulated cable, telephone cable, copper flexible cord, asbestos-insulated stove wire, copper magnet wire, 60 steel surface mounting cabinets, panelboard, chain for chain fenders and other equipment (Schedule 3341); until April 6, 10,000 lin. ft. of galvanized steel wire poultry netting, copper wire cloth, one 2500-lb. platform scale, two boiler feed pumps, turn-buckles, brass bell chain, gas regulators, pressure and vacuum gages, and other equipment (Schedule 3342).

Commanding Officer, Ordnance Department, Aberdeen Proving Ground, Aberdeen, Md., asks bids until March 30 for parts for stokers, including plates, filler plates, tuyeres, rods, etc. (Circular 73).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 29 for four electric-driven winches and spare parts (Schedule 3064) for Norfolk, Va., Navy Yard; until April 1, parts for airplanes (Schedule 900-1589) for Norfolk and Sewall's Point yards; mufflers, evaporators, distillers and spare parts (Schedule 3094) for Portsmouth Navy Yard; one revolving electric-operated truck crane, with lead battery (Schedule 3049); until April 5, motor-driven portable air compressor (Schedule 3103) for Eastern or Western Navy yard.

◀ BUFFALO DISTRICT ▶

Jamestown Metal Equipment Co., Allen Street, Jamestown, N. Y., manufacturer of automobile radiators, etc., has let general contract to Warren Construction Co., 335 Steele Street, for two-story addition, 40 x 60 ft., to occupy portion of site, 240 x 250 ft., near plant, recently acquired. Cost close to \$50,000 with equipment. Additional units will be built later.

National Aniline & Chemical Co., 351 Abbott Road, Buffalo, plans expansion and improvements, including new buildings to replace existing old structures and installation of equipment. Cost close to \$150,000 with machinery.

Curtiss Aeroplane Division, Curtiss-Wright Corp., Vulcan Street and Kenmore Avenue, Buffalo, has let general contract to Darin & Armstrong Co., 2041 Fenkel Street, Detroit, for two one-story additions. Cost close to \$100,000 with equipment.

◀ SOUTH ATLANTIC ▶

Crystal Springs Water Co., 92 N.E. Twenty-eighth Street, Miami, Fla., C. F. Kittel, head, has asked bids on general contract for one and one-half story mechanical-bottling, storage and distributing plant on N.E. Ninth Court, 30 x 75 ft. Cost about \$45,000 with equipment.

Quartermaster, Fort Screven, Ga., asks bids until March 28 for steel boiler tubes (Circular 826-25).

Tallahassee Coca-Cola Bottling Co., Tallahassee, Fla., has asked bids on general contract for two-story mechanical-bottling plant, 72 x 90 ft. Cost close to \$50,000 with equipment. Francis P. Smith, Norris Building, is architect.

◀ SOUTH CENTRAL ▶

Ashland Oil & Refining Co., Ashland, Ky., is arranging fund of about \$750,000 for expansion and improvements in oil refineries, storage and distributing facilities, including steel tanks, pumping equipment, etc. Company has approved plans for a skimming unit addition to Leach Oil refinery. Plans also are under way for new bulk terminals at Maysville and Covington, Ky.

United States Engineer Office, Memphis, Tenn., asks bids until March 29 for six finished cast steel ball joint retaining rings (Circular 226).

Masonite Corp., Laurel, Miss., manufacturer of insulating board, wall board and other special pressed wood pulp products, plans ad-

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dition for alcohol and other chemical manufacture, using waste material for raw products; a division will be installed for production of wood sugar from fine wood fiber. Cost over \$150,000 with equipment.

Ajax Coal Co., Ajax, Ky., plans rebuilding steel tipple at local coal-mining properties, recently destroyed by fire. Loss close to \$30,000 with machinery.

Jacobs Stove Works, Bridgeport, Ala., E. P. Jacobs, head, has arranged with Board of City Trustees, Dickson, Tenn., for erection of one-story building, 110 x 900 ft., under long-term lease, for new plant for manufacture of stoves and ranges, including department for stove castings and assembling division. Cost over \$75,000 with equipment.

WESTERN PA. DIST.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has let additional contracts to Parkman Construction Co., Inc., 1033 East Ohio Street, for expansion and improvements in plant on Wilkens Avenue, Baltimore, for radio equipment-manufacturing division, including a one-story addition, 42 x 50 ft., making second unit for which company has secured award, and remodeling an existing one-story structure. Entire project will cost close to \$100,000. Hunting-Davis & Dunne, Century Building, Pittsburgh, are architects.

School District of Sugar Creek Township, Franklin, Pa., plans manual training equipment in new two-story and basement high school, for which bids have been asked on general contract. Cost about \$200,000. Lawrie & Green, 111 South Front Street, Harrisburg, Pa., are architects.

River Seam Coal Co., Morgantown, W. Va., plans new tipple and installation of mining machinery at recently acquired property in Monongalia County, heretofore held by Monoc Coal Co., Cleveland. Cost close to \$60,000 with equipment.

OHIO AND INDIANA

Cleveland Pneumatic Tool Co., 3734 East Seventy-eighth Street, Cleveland, has asked bids on general contract for two-story top addition to present three-story building, 54 x 180 ft. Cost over \$65,000 with equipment. Ernest McGeorge, East Ninety-third and Quincy Streets, is consulting engineer.

City Council, Reading, Ohio, has authorized plans for extensions and improvements in municipal electric power plant, including new turbine unit and auxiliary equipment. Cost about \$80,000. Carl J. Kiefer, Inc., Schmidt Building, Cincinnati, is consulting engineer.

Orville Simpson Co., 1230 Knowlton Street, Cincinnati, manufacturer of screening, sifting and other machinery and parts, has plans for four-story addition, 62 x 66 ft., bids to be asked soon on general contract. Cost close to \$75,000 with equipment. Samuel Hannaford & Son, Dixie Terminal Building, are architects.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 28 for 137 flexible shaft assemblies, turn indicator, 10 ft. 5 in. long (Circular 804), five motor-driven pump assemblies (Circular 808), two computers (Circular 809); until March 29, ground rods, ground wire clamps, electric ventilator, floodlight lamp assemblies, etc. (Circular 801); until April 8, 100 propeller blade assemblies (Circular 807).

Pugh Milling Co., Caldwell, Ohio, plans rebuilding part of flour mill recently destroyed by fire. Loss about \$50,000 with screening, conveying, loading and other mechanical equipment.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until March 28 for 200,000 galvanized wire tent slips and 3000 tent hooks (Circular 431-127).

MICHIGAN DISTRICT

Gar Wood Industries, Inc., 7924 Riopelle Avenue, Detroit, manufacturer of motor speed boats, automobile bodies, trailers, etc., is ar-

ranging for removal of motor coach division from Detroit to branch plant at Marysville, Mich., for increased production facilities. Vacated space at Detroit works will be used for tank-manufacturing division, where production also will be expanded.

Fruit Belt Cooperative Electric Association, Paw Paw, Mich., plans new electric generating power plant for rural electric system. Cost about \$100,000 with equipment. Financing has been arranged through Federal aid. New rural lines to cost about \$90,000 also will be built.

Ford Motor Co., Dearborn, Mich., has asked bids on general contract for one-story addition at River Rouge plant, 300 x 1225 ft., for a tool and die shop. Cost over \$1,000,000 with machinery. Giffels & Vallet, Inc., and L. Rossetti, Marquette Building, Detroit, are consulting engineers.

Anheuser-Busch, Inc., 721 Pestalozzi Street, St. Louis, brewer, has plans for extensions and improvements in branch storage and distributing plant at 1969 West Fort Street, Detroit. Cost close to \$50,000 with equipment. Pollmar, Ropes & Lundy, 2539 Woodward Avenue, Detroit, are architects.

SOUTHWEST

State Building Commission, Merchants Bank Building, Jefferson City, Mo., asks bids until March 29 for addition to power plant at local state penitentiary. Cost about \$250,000 with equipment. Charles Haskins, Finance Building, Kansas City, Mo., is supervising engineer; W. D. Weidlein Co., Railway Exchange Building, Kansas City, Mo., is mechanical engineer.

Terminal Cotton Oil Mill Co., 5 East Frisco Avenue, Oklahoma City, Okla., plans rebuilding part of plant recently destroyed by fire, including storage and distributing unit. Loss about \$100,000 with equipment.

Graybar Electric Co., 320 South Wichita Street, Wichita, Kan., electrical equipment, has let general contract to Frank E. Blaser Construction Co., 432 North Rock Island Avenue, for one-story and basement storage and distributing plant, 100 x 120 ft. Cost about \$50,000 with equipment. Main offices of company are in New York.

Firestone Tire & Rubber Co., 421 North Main Street, Houston, Tex., has plans for extensions and improvements in two-story factory branch, storage and distributing plant. A top story addition will be built later. Cost close to \$60,000 with equipment. Charles Chase, Jr., 911 Stuart Street, is architect.

Quartermaster, ACAFS, Kelly Field, Tex., asks bids until March 29 for bolts, screws, tacks, wire cloth, fasteners, wire brads, staples, nails, pulleys, etc. (Circular 464-19).

Houston Lighting & Power Co., Houston, Tex., has authorized plans for addition to steam-electric generating plant with installation of new 25,000-kw. turbo-generator unit, high-pressure boilers and auxiliary equipment. Cost about \$2,000,000. Company also will make extensions in transmission and distributing lines and will expend about \$795,000 for this purpose this year, \$200,000 for substation units, transformers and auxiliary equipment, and \$75,000 for rural electric lines. Phoenix Engineering Corp., 2 Rector Street, is engineer for power plant addition.

MIDDLE WEST

Marquette Cement Mfg. Co., 140 South Dearborn Street, Chicago, plans new bulk cement terminal at Vickburg, Miss., where site is being selected. Cost about \$250,000 with conveying, loading and other mechanical-handling equipment.

United States Engineer Office, Chicago, asks bids until April 2 for one full-revolving, diesel engine-motored, combination clamshell crane and dragline excavator, mounted on crawler-tread truck (Circular 101).

Smith & Peury, Inc., 3559 West Harrison Street, Chicago, automobile construction and repairs, parts, etc., has leased for expansion

one-story building at 4512-18 West Madison Street, on site 100 x 175 ft.

Standard Oil Co. of Indiana, Inc., 910 South Michigan Avenue, Chicago, has begun work on new one-story bulk oil storage and distributing plant, 117 x 162 ft., at Sioux City, Iowa, for which general contract recently was let to W. A. Klinger, Inc., Warneke Building, Sioux City. Cost close to \$100,000 with steel tanks, pumping equipment and other facilities. W. A. Honomichi, Badgerow Building, Sioux City, is local manager.

United States Engineer Office, City National Bank Building, Omaha, Neb., asks bids until March 30 for one clamshell bucket (Circular 249).

Waukegan Steel Sales & Welding Works, 1405 Belvidere Street, Waukegan, Ill., has taken out a permit for one-story addition, 34 x 62 ft., superstructure to begin at once.

Supervising Construction Engineer, U. S. Indian Service, Billings, Mont., asks bids until March 28 for five 2-kw. electric generating units.

International Harvester Co., 606 South Michigan Avenue, Chicago, has asked bids on general contract for new one-story factory branch, storage and distributing plant for implement division at Omaha, Neb. Cost close to \$90,000 with equipment. Omaha headquarters are at 714 South Tenth Street.

International Color Printing Co., Peoria, Ill., plans rebuilding part of plant recently destroyed by fire. Loss close to \$150,000 with equipment.

Standard Steel Spring Co. has announced that it has been made necessary by general business conditions, particularly in the automotive industry, to cease operation of its plant at Racine, Wis. Company's plants at Coraopolis, Pa., and Gary, Ind., will continue on their present schedules. The Racine shop, which will be kept intact, employed upward of 200 men, mostly skilled labor, at its peak last fall, but has since sharply curtailed the force.

PACIFIC COAST

Monarch Brewing Co., 1850 North Main Street, Los Angeles, has plans for one-story mechanical-bottling works, 73 x 150 ft. Cost over \$60,000 with equipment. Hugo Eckart, 1015 East Eighth Street, is engineer.

Bureau of Reclamation, Denver, asks bids until March 28 for one 17½-ton motor-operated traveling crane for Government warehouse at Shasta Dam, Central Valley Project, Cal. (Specifications 1049-D).

Nehi Bottling Co., 121 East Fremont Street, Stockton, Cal., has let general contract to T. E. Williamson, Stockton, for one-story mechanical-bottling plant. Cost about \$45,000 with equipment.

United Dressed Meats, Inc., 116 North Havana Street, Spokane, Wash., has plans for new two-story meat-processing and packing plant. Cost close to \$50,000 with equipment. Arthur Bartron, 511 West Comstock Street, Seattle, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 1 for space parts for airplanes (Schedule 900-1593) for San Diego Naval Air Station; portable triple conductor cable (Schedule 3065) for Mare Island Navy yard; one motor-driven balancing machine (Schedule 3080) for Puget Sound yard; until April 5, electric transformers, oil switches, potheads, control panels and other equipment (Schedule 3105) for Seattle.

Old Mission Packing Corp., San Diego, Cal., food packer, has let general contract to George Kruger, 4229 Forty-eighth Street, for one-story addition, including remodeling of existing building. Cost about \$45,000 with equipment. Frank L. Hope, Jr., San Diego Trust & Savings Building, is architect.

United States Engineer Office, Portland, asks bids until March 30 for one vertical wet pit propeller-type pumping unit, with motor, exciter and control equipment, auxiliary valve, etc., for Diking District No. 1, near Woodland, Cowlitz County, Wash. (Circular 440).

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powers the main drive, while the hoisting and boomer power units are triple reductions of drop forged heat treated chrome nickel steel spur gears. For slewing, there is an alloy steel deep section bull gear with machine cut teeth. Plenty of power behind these cranes!

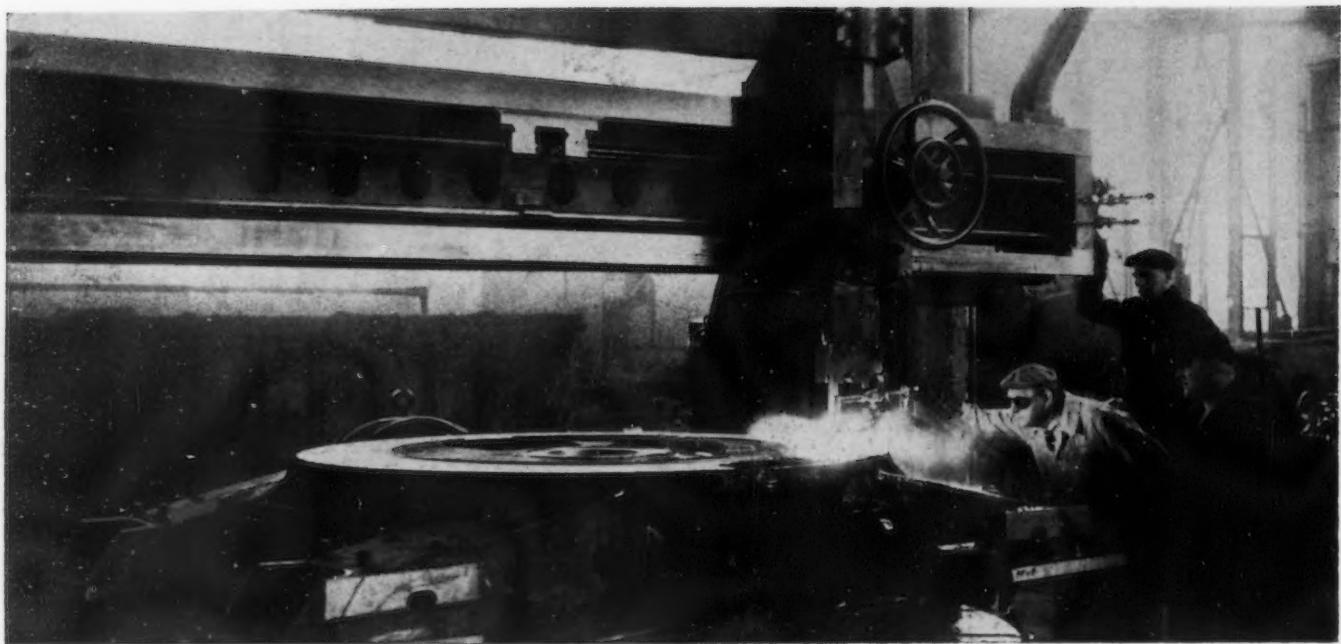
And for extra safety there is the fool-proof braking which automatically applies itself as soon as the operator releases the foot pedal. A real safety factor! But these are only a few of the features that put the economy spotlight on Yale Crane Trucks. Send for illustrated folder that will tell you about the rest—or contact the nearest Yale representative.



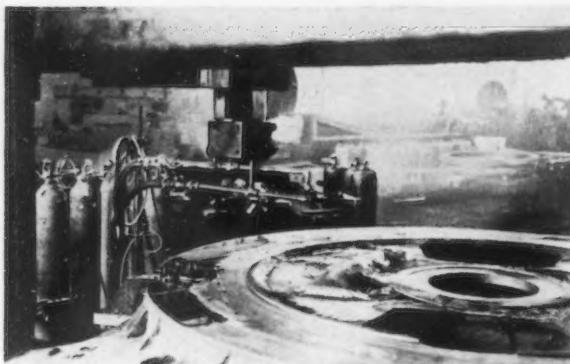
Yale Crane Trucks can be equipped with rigid or telescopic booms of varying lengths suitable for loading and unloading railroad cars—lifting sheet metal—stacking pipe—handling scrap—moving and setting heavy objects, etc.



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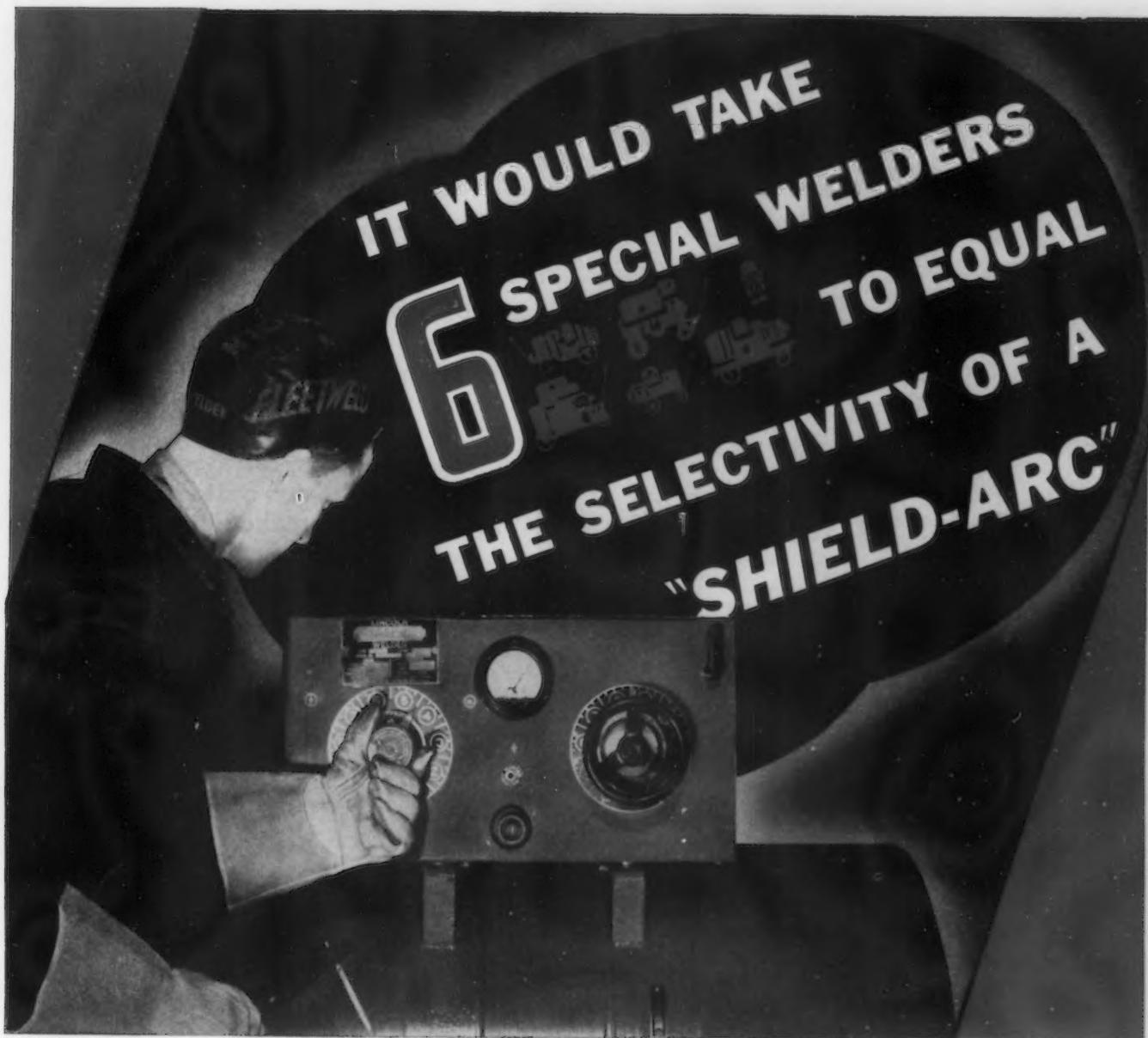
Hardness tests and straight-edge check-ups of the finished job showed that the desired hardness had been obtained without a sign of warpage. Time and cost were also highly satisfactory. Results, in fact, were so gratifying that the process was applied to other parts.

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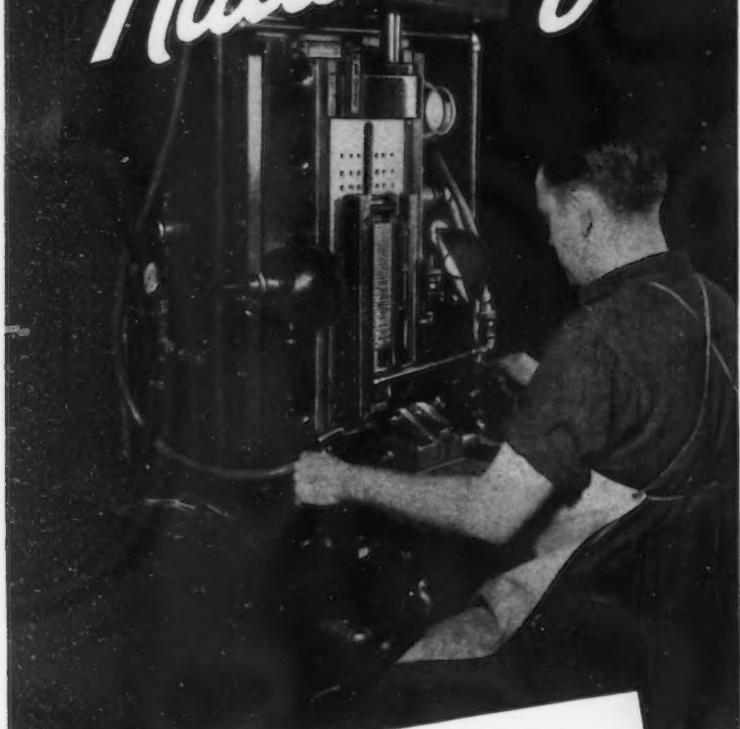
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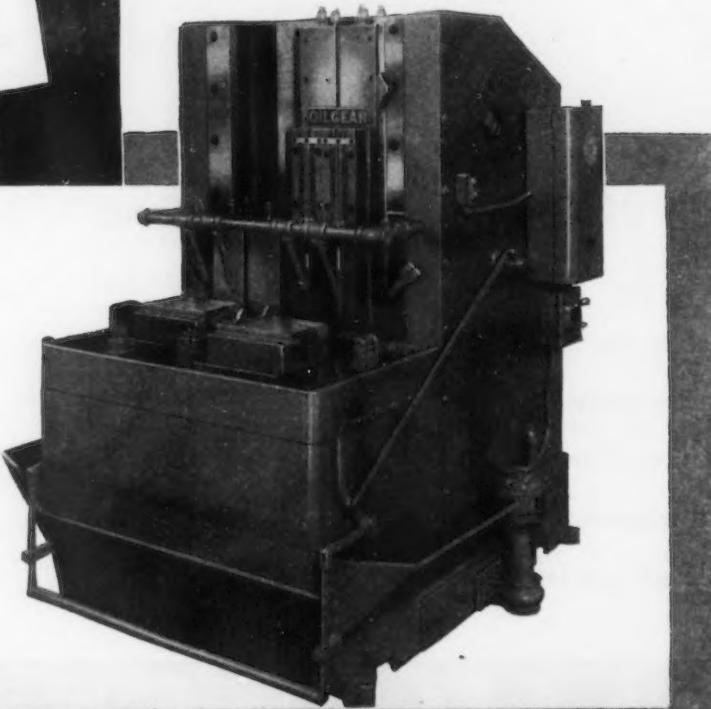


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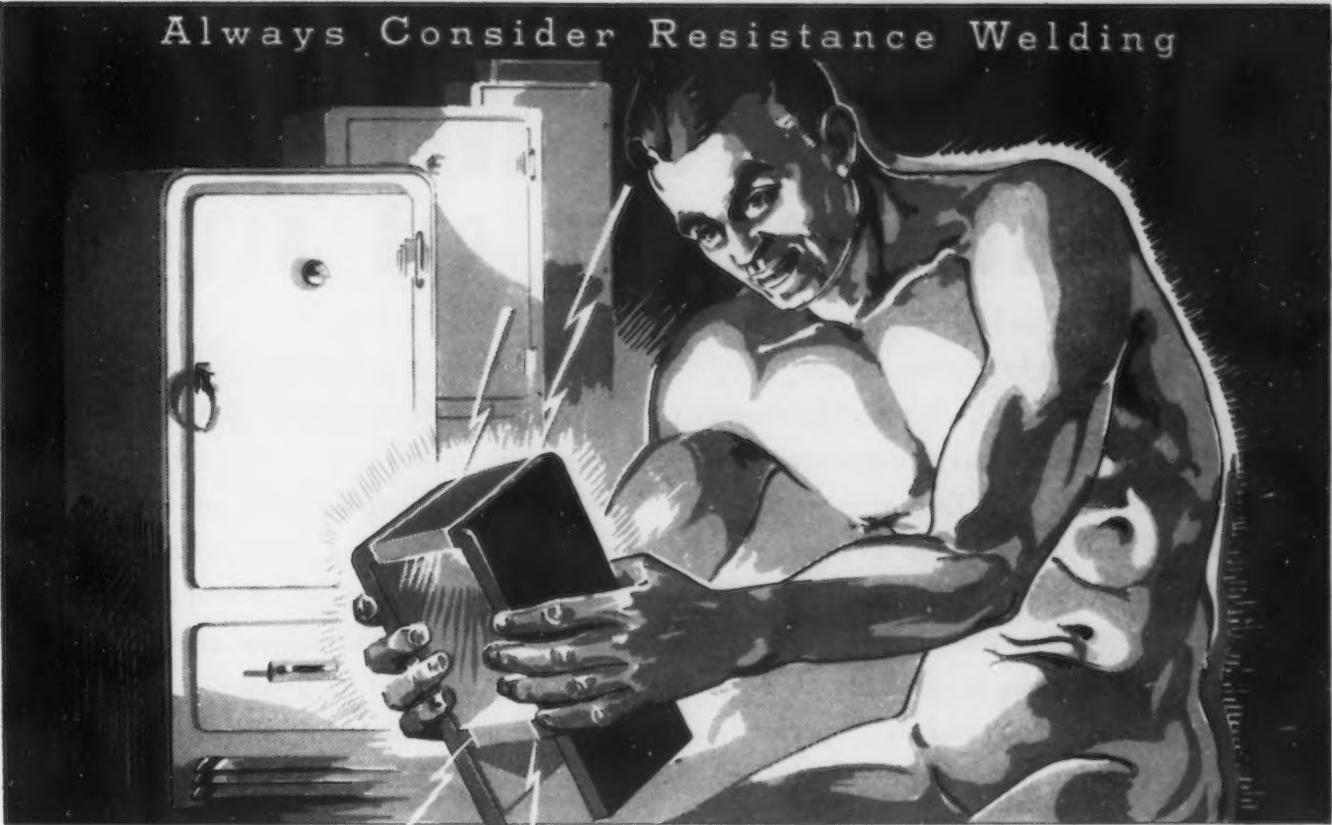
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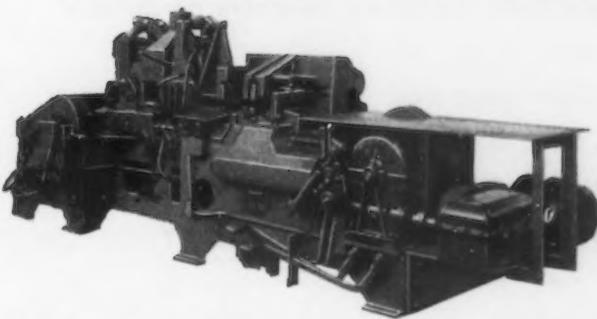
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RESISTANCE WELDING • *Imperative* *In Modern Metal Fabrication Design*



This Federal Strip Welder combines in one unit a Federal Flash Welder and a Federal Improved Patented Plow Type Flash Trimmer for welding strip in the continuous pipe mill of a large manufacturer of butt-welded pipe. The welder is rated 200 KVA and will butt-flash weld mild steel up to 12 inches wide, in thickness 1/16 inch to 3/16 inch. The flash trimmer removes the flash from both surfaces of the strip simultaneously to within .005 inch tolerance. Exclusive of loading and unloading time, the time for welding and trimming operations will not exceed 40 seconds for the maximum width and thickness. Welding and stripping operations are fully automatic with adjustments provided for maximum flexibility. Federal has designed and built machines to accommodate up to 80 inch strip for continuous strip mills.

• Where the design and attractiveness of a metal product influences or governs the demand, there you will find Resistance Welding doing a job more efficiently and more economically than by any other known method. There is no other way, in fact, that the same results can be obtained with the same degree of accuracy, speed, strength and savings as that obtained by this modern metal construction process. There is no other way that metals can be fabricated to provide a similarly smooth surface, without overlapping joints, and thereby facilitate enameeling or other desired finishes. In the manufacturing of re-

frigerators, washing machines, metal barrels, automobiles and railroad equipment, as well as many smaller products, Federal Flash, Seam and Spot Welding Machines play a stellar role in manufacturing processes. For design and beauty, as well as utility and service, Resistance Welding produces a joint or connection as strong as the parent metal, at high speed and low cost, with non-porous surface to facilitate and enhance whatever finish may be desired. Federal Engineers, with 26 years of welding experience, are constantly designing special and standard welding equipment to meet the exacting demands of industry for improved designing possibilities, speedier production and lower operating costs.

the
 **FEDERAL**

MACHINE & WELDER CO.

SALES OFFICES IN -

WARREN, OHIO

ALL PRINCIPAL CITIES

STRENES METAL

THE LAST WORD IN DIE ALLOYS

If you use drawing and forming dies, read on, for you won't want to miss the amazing story about Strenes metal . . . the cast-to-shape alloy that continues to set new economy and performance records in field after field.

In the first place, Strenes dies are inexpensive. Not only is the metal itself comparatively low in price, but machining in many cases becomes unnecessary. A case in point is a grave vault end die . . . perfectly cast and requiring absolutely **no** machining. We don't claim this for all dies of Strenes metal, but it does show what is being done.

In the second place Strenes dies have unbelievable resistance to wear. An example is a refrigerator top die set calling for a 3" double-cornered draw out of .050 material. This die has produced more than $\frac{3}{4}$ million stampings and is still in excellent condition.

In the third place, Strenes dies are exceptionally low in upkeep. They don't gaul and "pick-up", making stoning and polishing

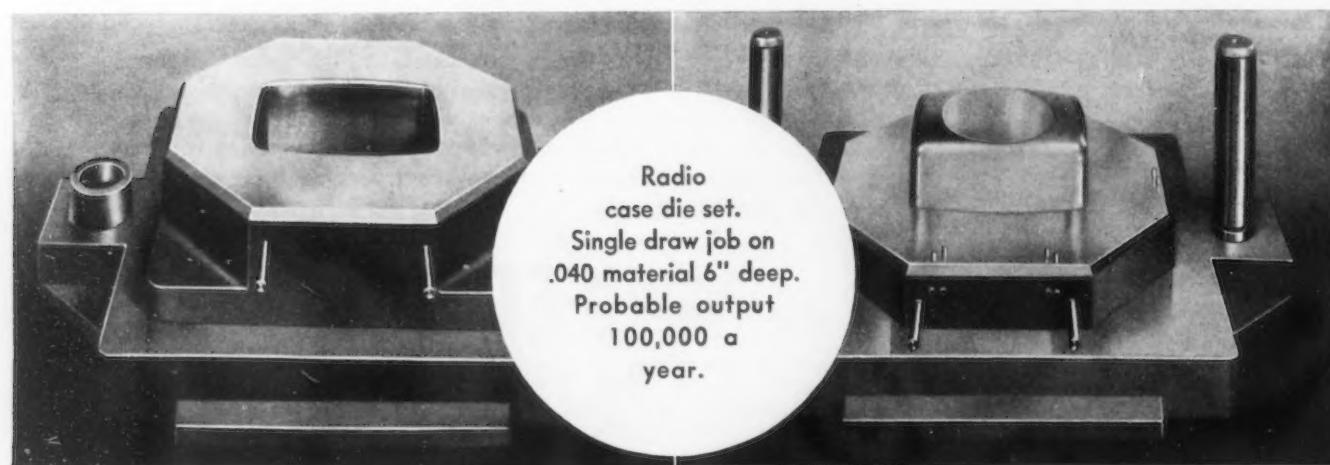
operation very infrequent . . . only 1/3 to 1/6 as often as with ordinary dies.

What gives Strenes metal such characteristics? The answer lies in its secret formula, which enables us to combine **all** desirable properties in one alloy. And we might add that, despite constant attempts at imitation, only Strenes gives the perfect combination.

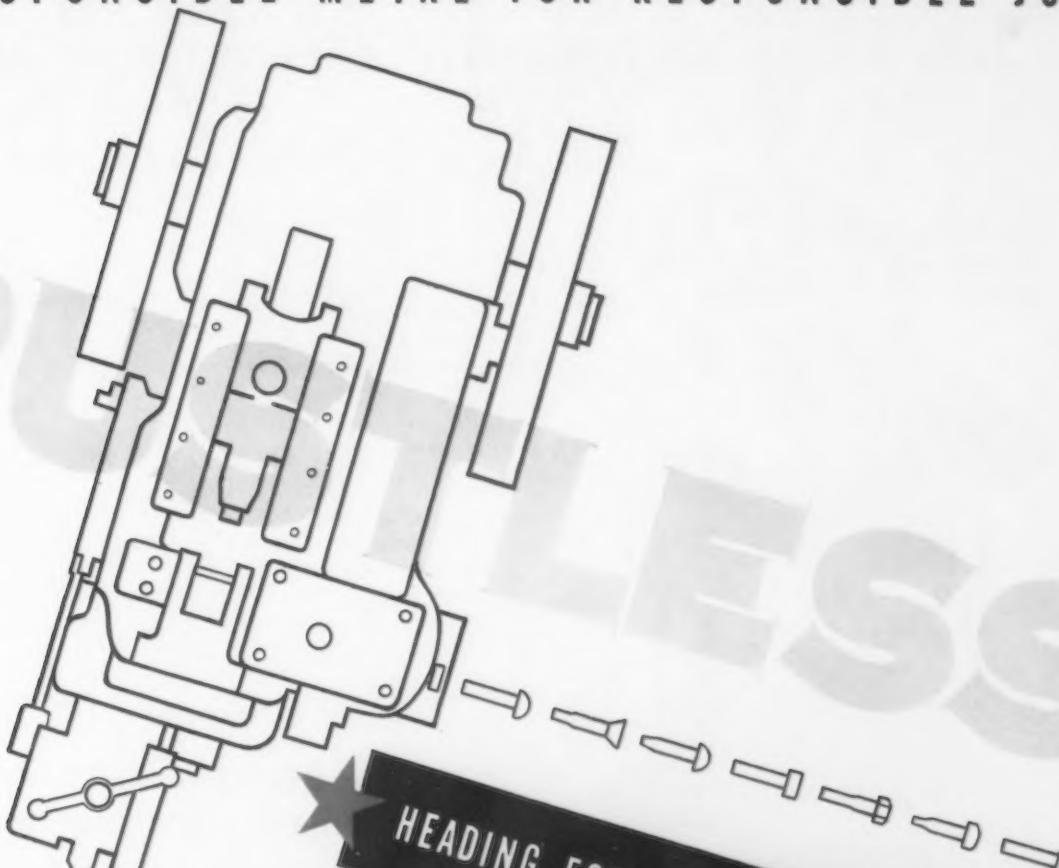
For your information, Strenes is a chrome, nickel, molybdenum alloy with a high steel base. 50,000 minimum tensile. Can be heat-treated to a hardness of 525 to 550 Brinell or 55 Rockwell C. 4,000 transverse. .23 deflection. Makes a long run, close grained, high strength alloy casting. Takes a high polish. Gives excellent graphitic surface lubrication, especially noticeable on difficult draws.

Cast your next drawing and forming dies of Strenes metal. You can't fail to get REAL results. THE ADVANCE FOUNDRY CO., Dayton, Ohio.

Representatives: W. R. McDonough & Co., National Bldg., Cleveland, Ohio • F. W. Peterson, 7310 Woodward Ave., Detroit, Michigan
Fred H. McGee, 917 Carter St., Chattanooga, Tennessee • Gilbert T. Osborne, 6037 Park Ave., Indianapolis, Ind.



THE RESPONSIBLE METAL FOR RESPONSIBLE JOBS



★ HEADING FOR PRODUCTION AND PROFIT

You could ask no more severe test of workability under conditions of modern high-speed production than is imposed on heading stock. Here, as elsewhere, Rustless demonstrates its excellence. Under tons of impact, the metal flows smoothly, without checking or cracking. Stock is left ductile; threads can be subsequently rolled, and slots easily cut.

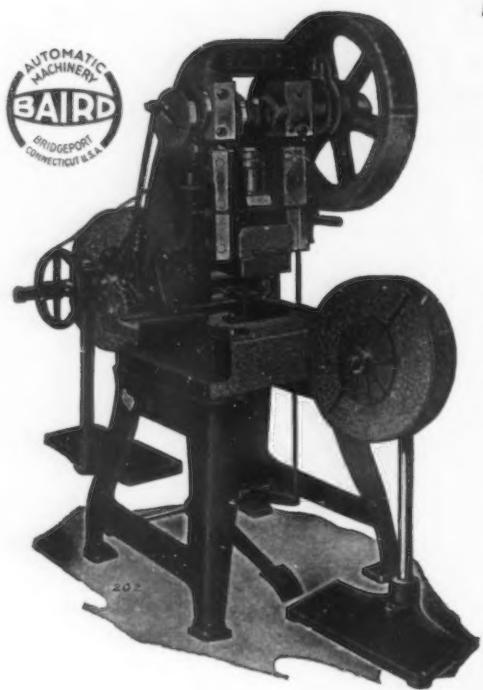
Specializing exclusively on the production of stainless steels, the Rustless organization has time to concentrate on the extra quality and little refinements that make such a big difference to the user.

RUSTLESS IRON AND STEEL CORPORATION • BALTIMORE • MD.
Producing Stainless Steels Exclusively

RUSTLESS
STAINLESS STEEL
BARS AND WIRE

SALES OFFICES: CHICAGO—4013 MILWAUKEE AVE. • CLEVELAND—731 SOCIETY FOR SAVINGS BLDG. • DETROIT—4-137 GENERAL MOTORS BUILDING • PHILADELPHIA—1263 COMMERCIAL TRUST BUILDING • DISTRIBUTORS IN PRINCIPAL CITIES

Combines Automatic Operation with Short Set-Up Time



In the BAIRD Automatic Press we have built a high production machine that is moderate in price and the set-up time in changing over from one attachment to another is surprisingly short.

Thus you can get rapid production and automatic operation on a wide variety of press jobs that will help you to meet competition. Let us show you what this automatic press would do on your work.



"Ask BAIRD About It"

**THE BAIRD MACHINE CO.
BRIDGEPORT, CONNECTICUT**

If you have a new catalog or booklet describing your products of interest to manufacturers in the metal-working industry, send a copy to *The Iron Age* and we will mention it on our "New Industrial Literature" page.

THE IRON AGE

239 West 39th St.

New York City

JUST BETWEEN US TWO

Capital City Ed. on Grid

PENETRATED this week by the cold, merciless rays of publicity are the inards of our Washington editor ("This Week in Washington").

Subject: *Leon W. Moffett*

Outstanding characteristic: Ability to make friends. If any other Capital correspondent has a wider acquaintance in official Washington than "Moff" has we wouldn't be interested. He knows everybody. Capital labyrinths are as familiar to him as the home hive to a queen bee. He never makes a wrong turn.

An executive of a certain company in the industry had occasion to call on one of the top rankers in the Navy Dept. This executive, also named Moffett, was announced. He walked in on the rear admiral, who greeted him, before looking up, with this, "How are you, Moff, you old?" "Moff" knows everybody.

Weakness: A staggering vocabulary which he is continually trying to throttle down. Is on intimate terms with such strangers as kyriologic, labefaction, saltant, pleonasm, paronymous, hispid.

Defying the classic conception of a Washington journalist, "Moff" is spartan, caneless, camel hair coatless. Missouri-bred, he flaps his A's. His disarming manner and shoe leather extravagance enable him to get the hard-to-get news. Only once has he cried "Uncle" when on a difficult trail. Is embarrassed when told that readers say his report is worth more to them than special Washington services costing half a century and up.

You might help us fulfill the first of two lifetime ambitions, which is to find a question relating to Washington that he can't answer offhand. The second is to induce him to wear a monocle.

Amen At Last

THAT patient gnawer at the roots of the capitalistic system, the anonymous "S. W." of Chicago, purrs:

"Like the Communists John H. Van Dewerter is a realist. He says, 'Congress cannot solve our unemployment problems by passing laws.' Just what Lenin spent his lifetime trying to drill into the heads of Socialists and Liberals—'You can't legislate yourself into Socialism.'

"If you get caught on the barricades just give 'em my name and I'll see you get put to work for your living."

We'll be the one with the gold-headed cane and fawn-colored spats.

Outgoing Bouquet

A PAT on the back to the man who thought of prefixing "Pennies from Heaven" with the words "Collect those . . ." and using the phrase to headline the Service Caster & Truck Company's ad urging that next-to-ceiling storage space be put to work.

Stopping power is present, too, in the same company's paradoxical head, "Trailers that are Real Leaders." Which leaves the door wide open for us to ask if you know why the short films that advertise coming movies are called "trailers." The chances are you don't even care, but anyway . . . they were originally called trail blazers, which they actually are. Speed in speech extinguished the "blaze," shortening the term to "trailers," which they aren't.

Plug for Old Nick

AN old acquaintance of the devil recently got hold of one of our self-addressed envelopes and writes us anonymously from Reading, Pa.:

"The devil the old soul robber and deceiver is hatred darkness and a dirty rotten old thief a robber a rascal a murderer and a liar. Warning. Resist the devil and he will flee from you. Friend try it once it works."

He speaks like a man who ought to know. We are always willing to take the advice of an expert, and would try it were it not for fear that it would work. At our age our vices are precious.

—A. H. D.



• MORNINGS typewriter clatter sounds business-like.

• BY NOON the continuous clatter is annoying.

• BUT BY 3 P.M. you're borrowing aspirin from your stenographer—or she from you.

• AND BY FIVE noise-battered nerves rebel. Wearily you trudge home—tired not from work, but from typewriter noise.

Make the five o'clock test. It's free. Have a Remington Noiseless in your office for one day of efficiency and quiet. You'll be less tired that night!

Remington Rand Inc.

• BUFFALO, N. Y.
World's Largest Manufacturers of
Noiseless and Portable Typewriters



More Remingtons built and sold in 1937 than any other make.

Products Index

WHO MAKES IT

Here you find a weekly listing of hundreds of products with the names and addresses of manufacturers. The advertisements of these companies appear in *The Iron Age*.

ABRASIVE WHEELS—See Grinding Wheels

ABRASIVE CLOTH & PAPER

Norton Co., Worcester, Mass.

ABRASIVES—Steel Shot and Grit

Pangborn Corporation, Hagerstown, Md.

ACCESSORIES—Welding

Lincoln Electric Co., The, Cleveland.

ACCUMULATORS—Hydraulic

Baldwin-Southwick Corp., Southwick Div., Philadelphia.

Wood, R. D., & Co., Philadelphia.

ACETYLENE—Dissolved in Cylinders &

Small Tanks

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

ACID-PROOF CEMENT

Havoc Corporation, Newark, Delaware.

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

ACIDS—Pickling

American Chemical Paint Co., Ambler, Pa.

Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.

Udylite Co., The, Detroit.

ANODES—All Types

Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.

ANODES—Cadmium

Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.

ANODES—Lead

National Lead Co., 111 Bdway., N. Y. C.

APPAREL—Welding

Lincoln Electric Co., The, Cleveland.

ARBORS

Cincinnati (Ohio) Milling Mach. Co., The, Morse Twist Drill & Mfg. Co., New Bedford, Mass.

ARMORING MACHINERY—Cable, Wire, Hose

Sleeper & Hartley, Inc., Worcester, Mass.

ARRESTERS—Spark

Harrington & King Perforating Co., Chicago.

AXLES—Car or Locomotive

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BABBITT METALS

Cadman, A. W., Mfg. Co., Pittsburgh, Pa.

Cramp Brass & Iron Foundries Co., Philadelphia.

BALLOWS—Ferro

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

ALLOYS—For Die Surfacing

Wilex-Kitch Div. of Eaton Mfg. Co., Detroit.

ALLOYS—Magnesium

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ALLOYS—Phosphor Bronze

Phosphor Bronze Smelting Co., The, Philadelphia.

ALLOYS—Titanium

Metal & Thermit Corp., 120 Broadway, N. Y. C.

ALLOYS—Tungsten

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

ALLOYS—Vanadium

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

ALLOYS—Zinc Base Die Casting

New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ALUMINUM

Aluminum Co. of America, Pittsburgh.

Seltzman, Arthur, & Co., Inc., 30 Rockefeller Plaza, R. C. A. Bldg., N. Y. C.

AMMETERS AND VOLTMETERS—Recording

Leeds & Northrup Co., Philadelphia.

AMMONIA RECOVERY PLANTS

Koppen Co., Pittsburgh.

ANGLES, BEAMS, CHANNELS AND TEES

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Inland Steel Co., Chicago.

Jones & Laughlin Steel Corp., Pittsburgh.

Ryerson, Jos. T., & Son, Inc., Chicago.

Seely Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.

Steel & Tubes, Inc., Cleveland.

Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

Weirton (W. Va.) Steel Co.

ANGLES, BEAMS, CHANNELS & TEES—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Jones & Laughlin Steel Corp., Pittsburgh.

Laclede Steel Co., St. Louis, Mo.

Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller

Bantam Bearings Corp., The, South Bend, Indiana.

Hyatt Bearings Div., General Motors Corp., Newark, N. J.

Norma-Hoffmann Bearings Corp., Stamford, Conn.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

Standard Machinery Co., Providence, R. I.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Tapered

Bantam Bearings Corp., The, South Bend, Indiana.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment

Bantam Bearings Corp., The, South Bend, Indiana.

Richardson Co., The, Melrose Park, Ill.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Self-aligning Roller

Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

BEARINGS—Shaft Hanger

Fafnir Bearing Co., New Britain, Conn.

Hyatt Bearings Div., General Motors Corp., Newark, N. J.

Norma-Hoffmann Bearings Corp., Stamford, Conn.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Thrust

Bantam Bearings Corp., The, South Bend, Indiana.

Fafnir Bearing Co., New Britain, Conn.

Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.

Hyatt Bearings Div., General Motors Corp., Newark, N. J.

New Departure Div., General Motors Corp., Bristol, Conn.

Norma-Hoffmann Bearings Corp., Stamford, Conn.

SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

Timken Roller Bearing Co., The, Canton, O.

BELT—Conveyor, Elevator

Goodrich, B. F., Co., The, Akron, Ohio.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTING—Leather

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

BELTING—Metal, Conveyor, High and Low Temperature

Acme Steel Co., Chicago, Ill.

Cambridge (Md.) Wire Cloth Co.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

BELTING—Rubber

Goodrich, B. F., Co., The, Akron, Ohio.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BELTING—V-Type

Allis-Chalmers Mfg. Co., Milwaukee.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BENCH LEGS—Steel

New Britain-Gridley Machine Div., The

New Britain Machine Co., New Britain, Conn.

BENDING MACHINES—Hand, Band and Angle

Excelsior Tool & Mch. Co., E. St. Louis, Ill.

BENDING MACHINES—Hand and Power

Cincinnati (Ohio) Shaper Co., The

Dreis & Krump Mfg. Co., Chicago.

G. D. S. Machinery & Supply Co., Inc.

101 Walker St., N. Y. C.

Kane & Roach, Inc., Syracuse, N. Y.

Niagara Machine & Tool Works, Buffalo, N. Y.

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BENZOL RECOVERY PLANTS

Koppers Co., Pittsburgh.

BERYLLIUM COPPER

American Brass Co., The, Waterbury, Conn.

BILLETS—Chrome Nickel Steel

Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Chrome Steel

Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Forging

Alan Wood Steel Co., Conshohocken, Pa. Harrisburg (Pa.) Steel Corp. Midvale Co., The, Nicetown, Phila., Pa. Republic Steel Corp., Cleveland, Ohio.

BILLETS—Re-rolling

Alan Wood Steel Co., Conshohocken, Pa.

BILLETS—Steel

Bethlehem (Pa.) Steel Company. Continental Steel Corp., Kokomo, Ind. Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BANKS—Chisel

Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, Ohio.

BLANKS—Gas and Pinion

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave., Richardson Co., The, Melrose Park, Ill.

BLAST CLEANING EQUIPMENT

American Foundry Equipment Co., The, 401 Brykln St., Mishawaka, Ind. Pangborn Corporation, Hagerstown, Md.

BLAST FURNACE SPECIALTIES

Bailey, Wm. M. Co., Pittsburgh.

BLAST FURNACES

Brassert, H. A. & Co., Chicago, Ill.

BLAST GATES

Rockwell, W. S. Co., 50 Church St., N.Y.C.

BLOCKS—Chain

Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

BLOWERS

American Blower Corp., 6000 Russell St., Detroit.

Ingersoll-Rand Co., 11 Broadway, N. Y. C.

BLOWERS—Rotary & Centrifugal

Roots-Connerville Blower Corp., Connerville, Ind.

BLOWPIPES—Oxy-Acetylene Welding & Cutting

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

Weldit Acetylene Co., Detroit.

BLOWPIPES—Soldering, Heating, Annealing

American Gas Furnace Co., Elizabeth, N.J. Weldit Acetylene Co., Detroit.

BOILERS

Munroe R. & Sons Mfg. Corp., Pittsburgh.

BOILERS—Waste Heat

Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS—Water Tube

Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOLT CUTTERS

Aene Machinery Co., Cleveland. Ajax Mfg. Co., The, Euclid, Ohio.

Landis Mch. Co., Inc., Waynesboro, Pa.

Manville, E. J. Mch. Co., Waterbury, Ct.

Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

BOLT & RIVET CLIPPERS

Bremill Mfg. Co., Erie, Pa.

Helwig Mfg. Co., St. Paul, Minn.

BOLTS—Carriage and Machine

Cleveland (Ohio) Cap Screw Co., The, Erie (Pa.) Bolt & Nut Co.

Lanson & Sessions Co., The, Cleveland.

Oliver Iron & Steel Corp., Pittsburgh.

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special

Erie (Pa.) Bolt & Nut Co.

Lanson & Sessions Co., The, Cleveland.

Oliver Iron & Steel Corp., Pittsburgh.

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS—Special, Hot or Cold Upset

Lanson & Sessions Co., The, Cleveland.

Oliver Iron & Steel Corp., Pittsburgh.

BOLTS—Stove

Lanson & Sessions Co., The, Cleveland.

BOLTS—Stove, Recessed Head

American Screw Co., Providence, R. I.

BOLTS—Track

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

BOLTS AND NUTS

American Screw Co., Providence, R. I. Clark Bros. Bolt Co., Milldale, Conn. Erie (Pa.) Bolt & Nut Co.

Lanson & Sessions Co., The, Cleveland.

Oliver Iron & Steel Corp., Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOLTS AND NUTS—Self-Locking

Lanson & Sessions Co., The, Cleveland, O.

BOND—Grinding Wheel

Bakelite Corp., 247 Park Ave., N. Y. C.

BOOTHS—Spray

DeVilbiss Co., The, Toledo, Ohio.

BORING BARS

Bullard Co., The, Bridgeport, Conn.

BORING, DRILLING & MILLING MACHINES—Horizontal

Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.

Lucas Machine Tool Co., Cleveland.

National Automatic Tool Co., Richmond Ind.

BORING & DRILLING MACHINES—Vertical

Baker Bros., Inc., Toledo, Ohio.

Bullard Co., The, Bridgeport, Conn.

BORING MACHINES—Diamond

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

BORING MACHINES—Jig

Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

BORING & TURNING MILLS—Vertical

Bullard Co., The, Bridgeport, Conn.

Cincinnati (Ohio) Planer Co.

Rogers Machine Wks., Alfred, New York.

BOX STRAPPING

Acme Steel Co., Chicago, Ill.

BRAKE LINING AND BLOCKS—Asbestos

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

BRAKES—Electric

Clark Controller Co., The, Cleveland.

Cutter-Hammer, Inc., Milwaukee.

BRAKES—Electric & Mechanical

Clark Controller Co., The, Cleveland.

Electric Controller & Mfg. Co., The, Cleveland.

BRAKES—Magnetic

Cincinnati (Ohio) Shaper Co., The.

Dreis & Krump Mfg. Co., Chicago.

Schatz Mfg. Co., The, Poughkeepsie, N. Y.

Steelweld Machinery Co., Cleveland.

BRICK—Acid Resisting

Keeler Brick Co., Steubenville, Ohio.

BRICK—Fire Clay

Carborundum Co., The, Niagara Falls, N. Y.

Illinoian Clay Products Co., Joliet, Ill.

Keeler Brick Co., Steubenville, Ohio.

BRICK—Insulating

Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BRIDGE BUILDERS

American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Belmont Iron Works, Philadelphia.

BRIDGE OPERATING MACHINERY—Movable

Earle Gear & Mch. Co., Philadelphia.

BRICKETS—Ferroalloy

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

BROACHES

LaPointe Machine Tool Co., The, Hudson, Mass.

BROACHING MACHINES

Bullard Co., The, Bridgeport, Conn.

Cincinnati (Ohio) Milling Mch. Co., The.

LaPointe Machine Tool Co., The, Hudson, Mass.

Oglebay Co., The, 1311 W. Bruce St., Milwaukee.

BRONZE FOR DIES

Ampco Metal, Inc., Milwaukee, Wis.

BRONZE—Phosphor

Bunting Brass & Bronze Co., Toledo, Ohio.

Phosphor Bronze Smelting Co., The, Phila.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

BUCKETS—Clamshell

Blaw-Knox Co., Pittsburgh.

Hayward Co., The, 50 Church St., N. Y. C.

Industrial Brownhoist Corp., Bay City, Mich.

BUCKETS—Electric Motor

Hayward Co., The, 50 Church St., N. Y. C.

BUCKETS—Orange Peel

Hayward Co., The, 50 Church St., N. Y. C.

BUFFERS & POLISHING MACHINES

Packer Machine Co., The, Meriden, Conn.

BUFFING APPLICATORS—Automatic

Packer Machine Co., The, Meriden, Conn.

BUILDINGS—Steel

American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

Bethlehem Iron Works, Philadelphia.

Blaw-Knox Co., Pittsburgh.

Brown & Root, Inc., Houston, Tex.

Carborundum Co., The, Bridgeport, Conn.

Chicago Bridge & Iron Co., Chicago.

Cleveland (Ohio) Steel Corp., The, Cleveland.

Corporation of America, The, Cleveland.

Foster & Johnson Machine Co., Pawtucket, R. I.

General Steel Co., The, Bridgeport, Conn.

GOSS and DE LEEUW

MULTIPLE SPINDLE
CHUCKING MACHINES

Two, Four, Five Spindles • Work and Tool Rotating Types
GOSS & DE LEEUW MACHINE CO., NEW BRITAIN, CONN.



THE ESPEN-LUCAS MACHINE WORKS
FRONT AND GIRARD AVE., PHILADELPHIA, PENNA.

LUCAS "PRECISION"
Horizontal Boring, Drilling and Milling Machine
THE LUCAS MACHINE TOOL CO.



CLEVELAND,
OHIO, U.S.A.

LELAND-GIFFORD COMPANY
Worcester, Mass.

Drilling Machinery
Belt and Motor Spindle
One to Six Spindles
Tapping Attachments and Multiple Heads



A Mainline Cartoon

...the only trade or business publication in the United States to publish the machine shop adventures of "The Bull of The Woods" is

THE IRON AGE

(Turn to page 60)

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CLAY GUNS
Ballei, Wm. M., Co., Pittsburgh.

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Detroit Rex Products Co., Detroit, Mich.
Ford, J. R., Co., The, Wyandotte, Mich.
Pennsylvania Salt Mfg. Co., Phila., Pa.

CLEANING COMPOUNDS—Alkali
Detroit Rex Products Co., Detroit, Mich.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CLEANING EQUIPMENT—Metal
Detroit Rex Products Co., Detroit, Mich.

CLEANING EQUIPMENT (Metal)—
Electro-Chemical
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CLOTHING—Asbestos & Fireproof
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CLUTCH-BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Fairbanks, Morse & Co., Chicago.
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Medart Co., The, St. Louis, Mo.

CLUTCHES—Magnetic
Cutler-Hammer, Inc., Milwaukee.
Dings Magnetic Separator Co., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

COAL
Appalachian Coals, Inc., Cincinnati, Ohio.
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Hanna Furnace Corp., The, Detroit, Mich.
Koppers Coal Co., Inc., The, Pittsburgh.
Pickands Mather & Co., Cleveland.

COAL, ORE AND ASH HANDLING
MACHINERY
Bartlett, C. O.-Snow Co., The, Cleveland.
Webster Mfg. Co., Chicago.

COAL SYSTEMS—Pulverized
Holbeck Engineering Co., Detroit.

COBALT METAL
Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Lead
National Lead Co., 111 Bdway., N. Y. C.

COILS—Pipe
Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Pickands Mather & Co., Cleveland.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., The, Cleveland.
Koppers Co., Pittsburgh.

COKE OVENS—By-Products
Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators
Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products
Koppers Co., Pittsburgh.

COLLETS
Riley Machine & Grinder, Inc., Boston, Mass.

COLLETS—Drill
Ametek Machine & Tool Co., The, Dayton, Ohio.

COLUMBIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

COMBUSTION CONTROLS
Brown Instrument Co., The, Philadelphia, Pa.

Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.

COMPOUNDS—Drawing
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Secony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Standard Oil Co. (Indiana), Chicago.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSORS—Air
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.

Curtis Pneumatic Machinery Co., 1948 Klenlen Ave., St. Louis, Mo.

DeVilbiss Co., The, Toledo, Ohio.

Fairbanks, Morse & Co., Chicago.

Ingersoll-Rand Co., 11 Broadway, New York City.

Pennsylvania Pump & Compressor Co., Easton, Pa.

Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas
Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.

Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONDENSERS—Surface & Jet
Ingersoll-Rand Co., 11 Broadway, N. Y. C.

Pennsylvania Pump & Compressor Co., Easton, Pa.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Worthington Pump & Machinery Corp., Harrison, N. J.

CONDUTS—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

CONTRACTORS' SUPPLIES — Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature
Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.

CONTROLLERS—Electric
Clark Controller Co., The, Cleveland.
Cutler-Hammer, Inc., Milwaukee.
Electric Controller & Mfg. Co., The, Cleveland.

General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated
Brown Instrument Co., The, Philadelphia, Pa.

Cutler-Hammer, Inc., Milwaukee.
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Vickers, Inc., 1420 Oakman Blvd., Detroit.

CONVEYING AND ELEVATING MACHINERY
Bartlett, C. O.-Snow Co., The, Cleveland.
Farquhar, A. B., Co., Ltd., York, Pa.
Logan Co., Inc., Louisville, Ky.

CONVEYOR WORMS
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Gravity
Logan Co., Inc., Louisville, Ky.

CONVEYORS—Monorail
American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable
Farquhar, A. B., Co., Ltd., York, Pa.

COOLING SYSTEMS—Water
Marley Co., The, Kansas City, Mo.

COPING MACHINES
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL
Secony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS—See Grinding Wheels

COTTERS AND KEYS—Spring
Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 759 Central Ave., Pontiac, Mich.

Lanson & Sessions Co., The, Cleveland.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES
Cleveland (Ohio) Twist Drill Co., The, Garling Tool Co., Detroit.

Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production
Veder-Root, Inc., Hartford, Ct.

COUNTING MACHINES
Veder-Root, Inc., Hartford, Conn.

COUPLINGS—Air Hose
Cleveland (Ohio) Pneumatic Tool Co., The.

COUPLINGS—Flexible
Diamond Chain & Mfg. Co., Indianapolis, Ind.

Lovetjoy Flexible Coupling Co., Chicago.

Poole Foundry & Mch. Co., Baltimore, N. Y.

COUPLINGS—Pipe
Harrisburg (Pa.) Steel Corp.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

CRANES—Crawling Tractor
American Hoist & Derrick Co., St. Paul, Minn.

Browning Crane & Shovel Co., Cleveland.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Industrial Brownhoist Corp., Bay City, Mich.

Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES—Electric, Industrial, Truck Mounted
Automatic Transportation Co., 75 West 87th St., Chicago, Ill.

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Browning Crane & Shovel Co., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling
Armel, James P., Pittsburgh.

Cleveland Crane & Engineering Co., Wickliffe, Ohio.

Conco Engineering Works, Mendota, Ill.

Curtis Pneumatic Machinery Co., 1948 Klenlen Ave., St. Louis, Mo.

Electric Hoist & Motor Co., 149 N. 9th St., Philadelphia, Pa.

Endicott Crane & Hoist Co., The, Endicott, N. Y.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.

Marie Brothers, Inc., Philadelphia.

Morgan Engineering Co., The, Alliance, O.

Northern Engineering Works, Detroit, Mich.

Reading (Pa.) Chain & Block Corp.

Robbins & Myers, Inc., Springfield, Ohio.

Shaw-Box Crane & Hoist Div., Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Monroe Falls, N. Y.

Whiting Corp., Harvey, Ill.

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Cleveland Crane & Engineering Co., Wickliffe, Ohio.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Morgan Engineering Co., The, Alliance, O.

Whiting Corp., Harvey, Ill.

CRANES—Hand Power
American Monorail Co., The, Cleveland.

Cleveland Crane & Engineering Co., Wickliffe, Ohio.

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Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
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National Engineering Works, Detroit.
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American Monorail Co., The, Cleveland.
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Conco Engineering Works, Mendota, Ill.
Euclid Crane & Hoist Co., The, Euclid, O.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

CRANES—Locomotive

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Browning Crane & Shovel Co., Cleveland.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Industrial Brownhoist Corp., Bay City, Mich.

Ohio Locomotive Crane Co., The, Bucyrus, O.

CRANES—Monorail

American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

Euclid Crane & Hoist Co., The, Euclid, O.

Northern Engineering Works, Detroit.
Reading (Pa.) Chain & Block Corp.

Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

Shepard Niles Crane & Hoist Corp., Monroe Falls, N. Y.

CRANES—Portable

Canton Dry & Mch. Co., Cleveland.

CRANES—Portable Electric
Automatic Transportation Co., 75 West 37th St., Chicago, Ill.

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Elwell-Parker Electric Co., The, Cleveland.

CRANKSHAFTS

Trans- & Williams Steel Forging Corp., Alliance, Ohio.

Union Drawn Steel Co., Massillon, Ohio.

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American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

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American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

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Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

Tomkins-Johnson Co., The, Jackson, Mich.

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Davis Keyseater Co., 400 Exchange St., Rochester, N. Y.

CUTTERS—Milling

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Brown & Sharpe Mfg. Co., Providence, R. I.
Cleveland (Ohio) Twist Drill Co., The.

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

Morse Twist Drill & Mch. Co., New Bedford, Mass.

Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

Victor Machinery Exchange, 251 Centre St., N. Y. C.

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Tabor Mfg. Co., Phila.

CUTTING-OFF MACHINES—Cold Saw

Espen-Lucas Mch. Wks., Philadelphia.

CUTTING-OFF MACHINES—Pipe or

Tubing

Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Bardons & Oliver, Cleveland.

Cox & Sons Co., The, Bridgeport, N. J.

Lands Mch. Co., Inc., Waynesboro, Pa.

CUTTING AND WELDING APPARATUS

—Oxy-Acetylene—See Welding and Cutting Machines and Equipment—Oxy-Acetylene.

CYLINDERS—Compressed Air & Hydraulics

Tomkins-Johnson Co., The, Jackson, Mich.

CYLINDERS—Seamless

Harrisburg (Pa.) Steel Corp.

National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

DEGREASING COMPOUNDS

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

DEGREASING MACHINES—Solvent

Detroit Rex Products Co., Detroit, Mich.

DEOXIDIZERS

Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

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Die BLOCKS—Drop Hammer

Heppenstall Co., Pittsburgh.

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Continental Machine Specialties, Inc., Minneapolis, Minn.

Grob Brothers, Grafton, Wis.

DIE SETS
U. S. Tool Co., Inc., Ampere, N. J.

DIE SINKING MACHINES—Automatic and Hand
Cincinnati (Ohio) Milling Mch. Co., The, Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

DIE STOCKS
Ridge Tool Co., Elyria, Ohio.

DIEING MACHINES—Automatic
Henry & Wright Mfg. Co., The, Hartford, Conn.

DIES, JIGS, FIXTURES, etc.
Atlantic Mfg. Co., Philadelphia.

Taft-Pelzer Mfg. Co., The, Woonsocket, R. I.

DIES—Alloy Surfaced
Wilcox-Rich Div. of Eaton Mfg. Co., Detroit.

DIES—Cast Tool Steel
Advance Foundry Co., The, Dayton, Ohio.

Forging & Casting Corp., The, Ferndale, Mich.

DIES—PIPE Threading
Landis Mch. Co., Inc., Waynesboro, Pa.

Murcley Machine & Tool Co., Detroit.

DIES—Screws and Thread Cutting
Eastern Mach. Screw Corp., New Haven, Ct.

Geometric Tool Co., The, New Haven, Conn.

Greenfield (Mass.) Tap & Die Corp.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

Murcley Machine & Tool Co., Detroit.

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Eastern Mach. Screw Corp., New Haven, Ct.

Geometric Tool Co., The, New Haven, Conn.

Jones & Lamson Mch. Co., Springfield, Vt.

Landis Mch. Co., Inc., Waynesboro, Pa.

Murcley Machine & Tool Co., Detroit.

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Worcester (Mass.) Stamped Metal Co.

DIES—Steel Letters and Stamps
Cunningham, M. E., Co., Pittsburgh.

Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

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Kinner Mfg. Co., Columbus, Ohio.

DOORS & SHUTTERS—Steel or Wood
Rolling
Kinner Mfg. Co., Columbus, Ohio.

DRAWN WORK—Metal—See Stampings or Drawings—Metal

DRILL FILING SYSTEMS
Hunt Mfg. Co., 500 Robert St., St. Paul, Minn.

DRILL HEADS—Hydraulic
National Automatic Tool Co., Richmond, Ind.

DRILL HEADS—Multiple
Baker Bros., Inc., Toledo, Ohio.

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

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Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Heavy Duty
Baker Bros., Inc., Toledo, Ohio.

DRILLING MACHINES—Multiple Spin die
Baker Bros., Inc., Toledo, Ohio.

Henry & Wright Mfg. Co., The, Hartford, Conn.

National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Adjustable
National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Multiple Spin die Horizontal
Baker Bros., Inc., Toledo, Ohio.

National Automatic Tool Co., Richmond, Ind.

DRILLING MACHINES—Portable Electric
Black & Decker Mfg. Co., The, Towson, Md.

Chicago Pneumatic Tool Co., 6 East 4th St., N. Y. C.

Millers Falls Co., Greenfield, Mass.

DRILLING MACHINES—Portable Pneumatic
Chicago Pneumatic Tool Co., 6 East 4th St., N. Y. C.

Cleveland (Ohio) Pneumatic Tool Co., The.

Hewitt Mfg. Co., St. Paul, Minn.

Ingersoll-Rand Co., 11 Broadway, New York City.

Warren & Swasey Co., The, Cleveland.

DRILLING MACHINES—Radial
Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Sensitive
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Upright
Baker Bros., Inc., Toledo, Ohio.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleerman Machine Tool Co., Green Bay, Wis.

DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.

Cincinnati (Ohio) Bickford Tool Co., The.

Cleerman Machine Tool Co., Green Bay, Wis.

DRIVES—Gear
Farrel-Birmingham Co., Inc., Buffalo, N. Y.

Mesta Mch. Co., Pittsburgh.

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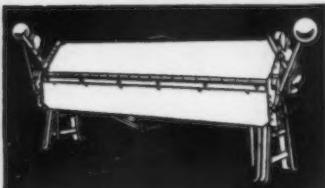
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Blaw-Knox Co., Pittsburgh.

Pangborn Corporation, Hagerstown, Md.

Whiting Corp., Harvey, Ill.

ECONOMIZERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

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Globar Div., The Carborundum Co., Niagara Falls, N. Y.

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General Electric Vapor Lamp Co., Hoboken, N. J.

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Roebeling's, John A., Sons Co., Trenton, N. J.

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Harnischfeger Corp., 4101 W. National Ave., Milwaukee.

Lincoln Electric Co., The, Cleveland.

Maurath, Inc., 7400 Union Ave., Cleveland.
Metal & Thermit Corp., 120 Broadway, N. Y. C.

ELECTROPLATING EQUIPMENT & SUPPLIES

Udylite Co., The, Detroit.

United Chromium, Incorporated, 51 East 42nd St., N. Y. C.

ELEVATORS—**Portable**

Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

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Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.

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Carborundum Co., The, Perth Amboy, N. J.

FACTORY & PLANT SITES

Zoll, Edward H., Inc., 196 Market St., Newark, N. J.

FANS—**Cooling**

Perkins, B. F., & Son, Inc., Holyoke, Mass.

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American Blower Corp., 6000 Russell St., Detroit.

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Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

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American Felt Co., 315 Fourth Ave., N.Y.C.

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Pittsburgh (Pa.) Steel Co.

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Nicholson File Co., Providence, R. I.

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Carborundum Co., The, Perth Amboy, N. J.

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West Virginia Fire Clay Mfg. Co., Pittsburgh.

FITTINGS—Brass, Pipe and Tube

Commonwealth Brass Corp., Detroit.

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Knu-Vise Products Co., Detroit, Mich.

FLANGES—Forged Steel

Harrisburg (Pa.) Steel Corp.

Standard Steel Works Co., Burnham, Pa.

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FORGING MACHINES—Upset

American Machinery Co., Cleveland.

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Aluminum Co. of America, Pittsburgh.

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FORGINGS—Coin Pressed

Rockford (Ill.) Deno Forging Co.

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Bay City Forge Co., Erie, Pa.
Billings & Spencer Co., Hartford, Conn.
Canton (Ohio) Drop Forging & Mfg. Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Forging & Casting Corp., The, Fenddale, Mich.
Poor & Co., Canton Forge & Axle Wks., Canton, Ohio
Rockford (Ill.) Drop Forge Co.
Storms Drop Forging Co., Springfield, Mass.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Williams, J. H., & Co., Buffalo, N. Y.

FORGINGS—Hollow

Harrisburg (Pa.) Steel Corp.
National Forge & Ordnance Co., Irvine, Pa.

FORGINGS—Hollow Bored

American Hollow Boring Co., 1912 Raspberry St., Erie, Pa.

FORGINGS—Hydraulic Press, Iron or Steel

Atlas Drop Forge Co., Lansing, Mich.
Bethlehem (Pa.) Steel Company.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
National Forge & Ordnance Co., Irvine, Pa.
Standard Steel Wks. Co., Burnham, Pa.

FORGINGS—Magnesium Alloys

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

FORGINGS—Upset

Bethlehem (Pa.) Steel Company.
Lamson & Sessions Co., The, Cleveland.
Rockford (Ill.) Drop Forge Co.

FORMING MACHINES—Roll

Kane & Roush, Inc., Syracuse, N. Y.

FOUNDRY EQUIPMENT & SUPPLIES

Whiting Corp., Harvey, Ill.
FURNACE ENGINEERS

Electric Furnace Co., The, Salem, Ohio.
Flim & Drefelin Co., Chicago.
Kemp, C. M., Mfg. Co., The, Baltimore, Md.

Salem (Ohio) Engineering Co.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Annealing & Case Hardening

American Gas Furnace Co., Elizabeth, N. J.
Electric Furnace Co., The, Salem, Ohio.
Kemp, C. M., Mfg. Co., The, Baltimore, Md.

Leeds & Northrup Co., Philadelphia.
Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Billet or Ingot Heating

Flim & Drefelin Co., Chicago.
Salem (Ohio) Engineering Co.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Brass Melting

Monarch Engineering & Mfg. Co., The, Baltimore, Md.

FURNACES—Electric, Steel Melting

American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
General Electric Co., Schenectady, N. Y.

Pittsburgh (Pa.) Lectromelt Furnace Corp.

FURNACES—Enameling

Carborundum Co., The, Perth Amboy, N. J.

Electric Furnace Co., The, Salem, Ohio.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Forging

Electric Furnace Co., The, Salem, Ohio.

Holcroft & Co., Detroit.

Leeds & Northrup Co., Philadelphia.

Rockwell, W. S., Co., 50 Church St., N. Y. C.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Heat Treating, Automatic

Amer. Gas Furnace Co., Elizabeth, N. J.

Electric Furnace Co., The, Salem, Ohio.

Holcroft & Co., Detroit.

Leeds & Northrup Co., Philadelphia.

Rockwell, W. S., Co., 50 Church St., N. Y. C.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Heat Treating, Cyanide of Lead

Chicago (Ill.) Flexible Shaft Co.

Electric Furnace Co., The, Salem, Ohio.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Heat Treating, Electric

Electric Furnace Co., The, Salem, Ohio.

General Electric Co., Schenectady, N. Y.

Holcroft & Co., Detroit.

Hoskins Mfg. Co., Detroit, Mich.

Leeds & Northrup Co., Philadelphia.

Maeher, Paul Co., The, Chicago.

Rockwell, W. S., Co., 50 Church St., N. Y. C.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FURNACES—Heat Treating, Oil or Gas

Chicago (Ill.) Flexible Shaft Co.

Electric Furnace Co., The, Salem, Ohio.

Holcroft & Co., Detroit.

Maeher, Paul Co., The, Chicago.

Monarch Engineering & Mfg. Co., The, Baltimore, Md.

Rockwell, W. S., Co., 50 Church St., N. Y. C.

Surface Combustion Corp., 2375 Dorr St., Toledo.

FURNACES—Pack Heating Sheets

Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Wean Engineering Co., Inc., The, Warren, Ohio.

FURNACES—Rivet Heating, Electric

General Electric Co., Schenectady, N. Y.

FURNACES—Wire, Annealing and Galvanizing

General Electric Co., Schenectady, N. Y.

Surface Combustion Corp., 2375 Dorr St., Toledo.

GAGE BLOCKS

Ford Motor Co. (Johansson Division), Dearborn, Mich.

Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

GAGES—Dial

Starrett, L. S. Co., Athol, Mass.

GAGES—Electric

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GAGES—Plus and Snap

Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

GAGES—Thickness, for Rolling Mills

Haines Gauge Co., The, Phila., Pa.

GAGES—Thread Lead

Sheffield Gage Corp., Dayton, Ohio.

GAGES—Temperature

Weston Electrical Instrument Corp., Newark, N. J.

GALVANIZING

Castile, Joseph P., & Bros., Phila.

GALVANIZING COMPOUNDS

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

GALVANIZING PLANTS—For Sheets

Aetna-Standard Engineering Co., The, Youngstown, Ohio.

GAS ANALYSIS RECORDERS

Brown Instrument Co., The, Philadelphia, Pa.

GAS BOOSTERS and Exhausters

Roots-Cameras Blower Corp., Connersville, Ind.

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American Gas Association, 420 Lexington Ave., N. Y. C.

GAS PRODUCERS

Flinn & Drefelin Co., Chicago.

Koppers Co., Pittsburgh.

Morgan Construction Co., Worcester, Mass.

Wood, R. D., & Co., Philadelphia.

GAS RECOVERY COKE OVENS

Koppers Co., Pittsburgh.

GASKETS—Asbestos, Metal or Rubber

Garlock Packing Co., The, Palmyra, N. Y.

Johns-Manville Corp., 22 East 40th St., New York City.

GASKETS—Rubber

Goodrich, B. Co., The, Akron, Ohio.

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Elgin Gear & Machine Co., Phila.

Farrel-Birmingham Co., Inc., Buffalo, N. Y.

Gleson Works, Rochester, N. Y.

James, D. O., Mfg. Co., Chicago.

Philadelphia (Pa.) Gear Works.

Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

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Gleason Works, Rochester, N. Y.

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United Engineering & Fdry. Co., Pgh.

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Rellance Electric & Engng. Co., Cleveland.

Westinghouse Elec. & Mfg. Co., East Pgh.

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Barber-Colman Co., Rockford, Ill.

GEAR PLANNING MACHINES

Gleason Works, Rochester, N. Y.

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Gleason Works, Rochester, N. Y.

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Richardson Co., The, Melrose Park, Ill.

Gleason Works, Rochester, N. Y.

James, D. O., Mfg. Co., Chicago.

Simonds Mfg. Co., Pittsburgh.

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Farrel-Birmingham Co., Inc., Buffalo, N. Y.

Hough & Scott Co., 5112 Hamilton Ave., Cleveland.

James, D. O., Mfg. Co., Chicago.

Mesta Mch. Co., Pittsburgh.

Philadelphia (Pa.) Gear Works.

Simonds Mfg. Co., Pittsburgh.

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Chicago (Ill.) Rawhide Mfg. Co., The,

1306 Elston Ave.

General Electric Co., Schenectady, N. Y.

James, D. O., Mfg. Co., Chicago.

Simonds Mfg. Co., Pittsburgh.

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Poole Foundry & Mch. Co., Baltimore, Md.

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James, D. O., Mfg. Co., Chicago.

Simonds Mfg. Co., Pittsburgh.

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Cleveland (Ohio) Worm & Gear Co.

Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.

James, D. O., Mfg. Co., Chicago.

Philadelphia (Pa.) Gear Works.

Simonds Mfg. Co., Pittsburgh.

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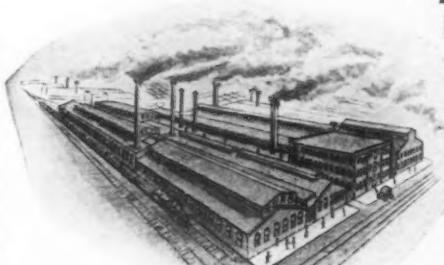
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 Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
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 Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
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HAMMERS—Chipping & Riveting—Pneumatic Chicago Pneumatic Tool Co., 6 East 44th St., N. Y. C.
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 Chambersburg (Pa.) Engineering Co.
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HAMMERS—Helve Bradley, C. C., & Son, Inc., Syracuse, N. Y.
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HANGERS—Roller Bearing Hangers Bearing Div., General Motors Corp., Newark, N. J.
HEADING MACHINES Ajax Mfg. Co., The, Euclid, Ohio.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Waterbury (Conn.) Farrel Foundry & Machine Co., The.
HEADS—Spun and Pressed Central Iron & Steel Co., Harrisburg, Pa.
 Worth Steel Co., Claymont, Del.
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HEAT RESISTING PRODUCTS—Electric Glebar Div., The, Carborundum Co., Niagara Falls, N. Y.
 Holden, A. F. Co., New Haven, Conn.
HEAT TREATING Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
 Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
 General Machine Wks., York, Pa.
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 Maehler, Paul Co., The, Chicago.
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 Ingersoll-Rand Co., 11 Broadway, N. Y. C.
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 Ridgway, Craig & Son Co., Coatesville, Pa.
HOISTS—Chain Reading (Pa.) Chain & Block Corp.
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 Euclid Crane & Hoist Co., The, Euclid, O.
 Northern Engineering Works, Detroit.
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 Cleveland Tramrail Div. of the Cleveland Crane & Engng. Co., Wickliffe, Ohio.
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 Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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 Aluminum Co. of America, Pittsburgh.
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 Phosphor Bronze Smelting Co., The, Phila.

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INSTRUMENTS—Recording
 Brown Instrument Co., The, Philadelphia, Pa.

Leeds & Northrup Co., Philadelphia.
INSULATION
 Johns-Manville Corp., 22 East 40th St., New York City.

IRON—Rustless
 Ludlum Steel Co., Waterbury, N. Y.
JIGS, FIXTURES, DIES, etc. (See Dies, Jigs, Fixtures, etc.)

KEYS—Riveted
 Western Wire Prods. Co., St. Louis, Mo.
KEYSEATING MACHINES
 Baker Bros., Inc., Toledo, Ohio.
 Davis Keyseater Co., 400 Exchange St., Rochester, N. Y.

LACING—Belt, Rawhide or Leather
 Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

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 General Electric Co., Cleveland.
LAMPS—Mercury Vapor
 General Electric Vapor Lamp Co., Hoboken, N. J.

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 Cincinnati (Ohio) Grinders Incorporated.
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 Bullard Co., The, Bridgeport, Conn.
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 Goss & De Leeuw Mch. Co., New Britain, Conn.

LATHES—Automatic Vertical
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 Gisholt Machine Co., Madison, Wis.

LATHES—Bench
 Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.
 Rivett Lathe & Grinder, Inc., Boston, Mass.

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 Jones & Lamson Mch. Co., Springfield, Vt.
 Potter & Johnston Machine Co., Pawtucket, R. I.

Warner & Swasey Co., The, Cleveland.

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 Monarch Mch. Tool Co., The, Sidney, O.

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 LeBlond, R. K., Mch. Tool Co., Cincinnati.
 Potter & Johnston Machine Co., Pawtucket, R. I.

LATHES—Engine
 Cincinnati (Ohio) Lathe & Tool Co.
 Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.

LeBlond, R. K., Mch. Tool Co., Cincinnati.
 Monarch Mch. Tool Co., The, Sidney, O.
 Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

LATHES—Roll
 Lewis Foundry & Mch. Co., Pittsburgh.
 Mesta Mch. Co., Pittsburgh.
 United Engineering & Fdry. Co., Pittsburgh.

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LATHES—Toolroom
 Cincinnati (Ohio) Lathe & Tool Co.
 LeBlond, R. K., Machine Tool Co., Cincinnati, Ohio.
 Monarch Mch. Tool Co., The, Sidney, O.
 Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

LATHES—Turret
 Acme Machine Tool Co., Cincinnati.
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 National Lead Co., 111 Bdway., N. Y. C.

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 Safety Equipment Service Co., Cleveland.

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 Baldwin Locomotive Wks., The, Paschal Sta., Phila.

Davenport (Iowa) Locomotives Works.

General Electric Co., Schenectady, N. Y.

Whitecomb Locomotive Co., Paschal Sta., Phila.

LOCOMOTIVES—Gas-Electric
 Davenport (Iowa) Locomotives Works.

LOCOMOTIVES—Gasoline
 Baldwin Locomotive Wks., The, Paschal Sta., Phila.

Plymouth (Ohio) Locomotive Wks., The, Paschal Sta., Phila.

Whitecomb Locomotive Co., Paschal Sta., Phila.

LOCOMOTIVES—Industrial
 Baldwin Locomotive Wks., The, Paschal Sta., Phila.

Davenport (Iowa) Locomotives Works.

Plymouth (Ohio) Locomotive Wks., The, Paschal Sta., Phila.

Whitecomb Locomotive Co., Paschal Sta., Phila.

LOCOMOTIVES—Steam
 Iron & Steel Products, Inc., Chicago.

LOCOMOTIVES—Storage Battery
 Atlas Car & Mfg. Co., The, Cleveland.

LUBRICANTS—Crusher & Grinding
 Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Gear
 Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Standard Oil Co., (Indiana), Chicago.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LATHES—Vertical
 Standard Oil Co., The, Bridgeport, Conn.

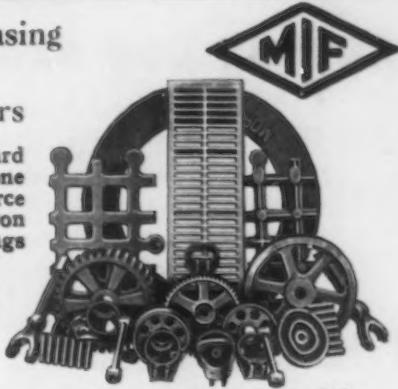
Bullard Co., The, Bridgeport, Conn.

Gisholt Machine Co., Madison, Wis.

LATHES—Bench
 Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.

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Products Index

LUBRICANTS—High Pressure & Temperature

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Pure Oil Co., The, Chicago.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Mine Cars

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Mining Machines

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Railroad

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Roll Neck—Anti-Friction & Plain

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICANTS—Tipple & Cleaning

Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Texas Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

LUBRICATING SYSTEMS

Farral Corp., The, Cleveland.

MACHINE GUARD MATERIALS

Erdle Perforating Co., Rochester, N. Y.

MACHINE WORK

General Machine Works, York, Pa.

Gifford-Wood Co., Hudson, N. Y.

Hodge Engineering Co., Buffalo, N. Y.

Taft-Pelce Mfg. Co., The, Woonsocket, R. I.

MACHINERY DEALERS—Second-Hand

(See Clearing House Section)

MACHINISTS' SMALL TOOLS

Brown & Sharpe Mfg. Co., Providence, R. I.

Millers Falls Co., Greenfield, Mass.

Starrett, L. S. Co., Athol, Mass.

MAGNESITE—Brick or Dead Burnt

Carborundum Co., The, Perth Amboy, N. J.

MAGNESIUM

Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

MAGNETS—Lifting

Cutter-Hammer, Inc., Milwaukee.

Electric Controller & Mfg. Co., The, Cleveland.

Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.

MALETS—Rawhide

Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

MANDRELS—Expanding

Nicholson, W. H. & Co., 165 Oregon St., Wilkes-Barre, Pa.

MANGANESE METAL AND ALLOYS

Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

Metco & Thermit Corp., 120 Broadway, N. Y. C.

MANHOLE FITTINGS AND SADDLES

Worth Steel Co., Clifton, Del.

MANIFOLDS—Oxygen & Acetylene

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

NITROGEN

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

NOZZLES—Sand Blasting

Norton Co., Worcester, Mass.

NOZZLES—Spray

Marley Co., The, Kansas City, Mo.

NUMBERING MACHINES—For Metal

Niles & Westbrook Mfg. Co., The, East Hartford, Ct.

NUTS—Aeron

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Castellated

National Acme Co., The, Cleveland.

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Cold Punched

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Hot Pressed

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

MARKING MACHINES
Nobie & Westbrook Mfg. Co., The, East Hartford, Conn.

METAL SPECIALTIES

Crosby Co., The, Buffalo, N. Y.

Grammes, L. F., & Sons, Inc., Allentown, Pa.

Toledo (Ohio) Stamping & Mfg. Co.

Torrington (Conn.) Company.

Whitehead Stamping Co., 1869 W. Lafayette Blvd., Detroit, Mich.

Worcester (Mass.) Stamped Metal Co.

METALLOGRAPHIC EQUIPMENT

Bausch & Lomb Optical Co., Rochester, N. Y.

METALS—Coating

Metals Coating Co. of America, Phila., Pa.

METERS—Electric Welding

Lincoln Electric Co., The, Cleveland.

METERS—Flow

Brown Instrument Co., The, Philadelphia, Pa.

Leeds & Northrup Co., Philadelphia.

Meters Co., The, Philadelphia.

Meters—Gas or Air Roots—Conversville Blower Corp., Connersville, Ind.

METERS—Water & Oil

Worthington Pump & Machinery Corp., Harrison, N. J.

MICA SCHIST

Edge Hill Silica Rock Co., New Brunswick, New Jersey.

MICRO-PHOTOGRAPHIC EQUIPMENT

Bausch & Lomb Optical Co., Rochester, N. Y.

MICROMETERS

Starrett, L. S. Co., Athol, Mass.

MICROMETERS—Dial for Sheet Metal

Haines Gauge Co., The, Phila., Pa.

MICROSCOPES—Toolmakers

Bausch & Lomb Optical Co., Rochester, N. Y.

MILLING MACHINES—Automatic

Cincinnati (Ohio) Milling Mch. Co., The, Potter & Johnston Machine Co., Pawtucket, R. I.

MILLING MACHINES—Horizontal

Brown & Sharpe Mfg. Co., Prov., R. I.

Cincinnati (Ohio) Milling Mch. Co., The, Potter & Johnston Machine Co., Pawtucket, R. I.

MILLING MACHINES—Planer Type

Cincinnati (Ohio) Planer Co.

MILLING MACHINES—Second-Hand

(See Clearing House Section)

MILLING MACHINES—Vertical

Brown & Sharpe Mfg. Co., Prov., R. I.

Cincinnati (Ohio) Milling Mch. Co., The, Potter & Johnston Machine Co., Pawtucket, R. I.

MOLDING MACHINES

Tabor Mfg. Co., Phila., Pa.

MOLYBDENUM

Climax Molybdenum Co., 500 Fifth Ave., N. Y. C.

MONEL METAL

International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

MONORAIL SYSTEMS—Hand & Electric

American Monorail Co., The, Cleveland.

Cleveland Tramrall Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

MOTORS—Electric

Allis-Chalmers Mfg. Co., Milwaukee.

Chicago (Ill.) Electric Co.

Delco Products Div. General Motors Corp., Dayton, Ohio.

Fairbanks, Morse & Co., Chicago.

General Electric Co., Schenectady, N. Y.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

Lincoln Electric Co., Cleveland.

Reliance Electric & Engineering Co., Cleveland.

Washington Elec. & Mfg. Co., E. Pitts.

MOTORS—Electric, Second-Hand

(See Clearing House Section)

NAILS—Wire

American Steel & Wire Co. (U. S. Steel Corp., Subsidiary), Cleveland.

Colombia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Hassall, John, Inc., Clay & Oakland Sts., Brooklyn, N. Y.

Pittsburgh (Pa.) Steel Co.

Wickwire Brothers, Cortland, N. Y.

Youngstown (Ohio) Sheet & Tube Co., The.

NIBBLING MACHINES

Gray Machine Co., Philadelphia.

NICKEL

International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

NITROGEN

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

NOZZLES—Sand Blasting

Norton Co., Worcester, Mass.

NOZZLES—Spray

Marley Co., The, Kansas City, Mo.

NUMBERING MACHINES—For Metal

Niles & Westbrook Mfg. Co., The, East Hartford, Ct.

NUTS—Aeron

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Castellated

National Acme Co., The, Cleveland.

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Cold Punched

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Hot Pressed

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Port Chester

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUMBERING MACHINES—For Metal

Niles & Westbrook Mfg. Co., The, East Hartford, Ct.

NUTS—Port Chester

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Port Chester

Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Port Chester

Russell, Burdsall &

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NUTS—Lock
Standard Pressed Steel Co., Jenkintown, Pa.

NUTS—Semi-Finished
Cleveland (Ohio) Cap Screw Co., The, Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Thumb Malleable
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Wing
Parker-Kalon Corp., 196 Varick St., N. Y. C.

OFFICE EQUIPMENT AND SUPPLIES
Remington Rand Inc., Buffalo, N. Y.

OIL & GREASE SEALS
Chicago (Ill.) Rawhilde Mfg. Co., The, 1306 Elston Ave.

Garlock Packing Co., The, Palmyra, N. Y.

OIL RETAINERS
Chicago (Ill.) Rawhilde Mfg. Co., The, 1306 Elston Ave.

OIL STONES
Carborundum Co., The, Niagara Falls, N. Y.

Norton Co., Worcester, Mass.

OILS—Cutting
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Standard Oil Co. (Indiana), Chicago, Ill.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Fuel
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Standard Oil Co. (Indiana), Chicago, Ill.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Sun Oil Co., Philadelphia.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.

Pure Oil Co., The, Chicago.

Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.

Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.

Standard Oil Co. (Indiana), Chicago, Ill.

Standard Oil Co. of New Jersey, 26 Broadway, N. Y. C.

Texaco Company, The, 135 East 42nd St., N. Y. C.

Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Soluble—See Oils—Cutting

ORES—Iron
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.

Hanna Furnace Corp., The, Detroit, Mich.

Pickands Mather & Co., Cleveland.

Shenango Furnace Co., Pittsburgh.

Snyder, W. P., & Co., Pittsburgh.

OVENS—Coke and By-Product Recovery
Koppers Co., Pittsburgh.

OVENS—Core and Mold
Herrick & Randall, Inc., Detroit.

Herrick & Co., Detroit.

Monarch Engineering & Mfg. Co., The, Baltimore, Md.

OVENS—Cross Regenerative
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OVENS—Enameling and Jappanning
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Herrick & Randall, Inc., Detroit.

Stenner, Phil Co., The, Chicago.

Surface Combustion Corp., 2375 Dorf St., Toledo.

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Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

PACKING—Felt
American Felt Co., 315 Fourth Ave., N. Y. C.

PACKING—Leather
Chicago (Ill.) Rawhilde Mfg. Co., The, 1306 Elston Ave.

Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Metallic
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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Garlock Packing Co., The, Palmyra, N. Y.

Johns-Manville Corp., 22 East 40th St., New York City.

PAINT
Midland Paint & Varnish Co., The, Cleveland.

National Lead Co., 111 Bdway., N. Y. C.

PERFORATED METAL
Chicago Perforating Co., 2440 W. 24th Place, Chicago, Ill.

Diamond Mfg. Co., Wyoming, Pa.

Eddle Perforating Co., Rochester, N. Y.

Harrington & King Perforating Co., Chicago.

Hendrick Mfg. Co., Carbondale, Pa.

MUNDT, CHAS., & SONS, 59 Fairmount Ave., Jersey City, N. J.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

PHOSPHOR—COPPER
Phosphor Bronze Smelting Co., The, Phila.

PICKLING COMPOUNDS
American Chemical Paint Co., Ambler, Pa.

PICKLING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

Mesta Mch. Co., Pittsburgh.

PICKLING TANK LININGS
Culicote Co., The, Cleveland.

Esseler Bick Co., Shreveport, La.

National Lead Co., 111 Bdway., N. Y. C.

PICKLING TANK STEAM JETS
Dietzel Lead Burning Co., Pittsburgh.

Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

PIG IRON
Bethlehem (Pa.) Steel Co.

Brooke, E. & G., Iron Co., Birdsboro, Pa.

Carnegie-Illinois Steel Corp., (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

PILING—Steel Pile
National Tube Co., (U. S. Steel Corp. Subsidiary), Pittsburgh.

PILING—Steel Sheet
Carnegie-Illinois Steel Corp., (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

PINIONS—Rolling Mill
Mesta Mch. Co., Pittsburgh.

PINIONS—Wire and Rod
Rathbone, A. B. & J., Palmer, Mass.

PINS—Cotter
Lamson & Sessions Co., The, Cleveland.

PIPE—Acid Resisting
Havoc Corporation, Newark, Delaware.

PIPE—Cast Iron, B. & S. and Flanged
Wood, R. D., & Co., Philadelphia.

PIPE—Hammer Welded
National Tube Co., (U. S. Steel Corp. Subsidiary), Pittsburgh.

PIPE—Lead
National Lead Co., 111 Bdway., N. Y. C.

PIPE—Lead Lined
National Lead Co., 111 Bdway., N. Y. C.

PIPE—New and Second-Hand
Albert & Davidson Pipe Corp., 2nd Ave., 50-51st St., Brooklyn, N. Y.

Albert Pipe Supply Co., Berry and N. 13th St., Brooklyn, N. Y.

Greenpoint Iron & Pipe Co., Inc., Stagg & Bogart Sts., Brooklyn, N. Y.

PIPE—Seamless Brass or Copper
American Brass Co., The, Waterbury, Conn.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

PIPE—Spiral Welded
American Rolling Mill Co., Middletown, O.

Crane Co., Chicago.

PIPE—Standard, Black and Galvanized
Bethlehem (Pa.) Steel Co.

Jones & Laughlin Steel Corp., Pittsburgh.

National Tube Co., (U. S. Steel Corp. Subsidiary), Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

Youngstown (Ohio) Sheet & Tube Co., The.

PIPE—Welded, Electric
National Tube Co., (U. S. Steel Corp. Subsidiary), Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

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PIPE FITTINGS
Crane Co., Chicago.

Industrial Pipe Co., Erie, Pa.

PIPE THREADERS
Ridge Tool Co., Elyria, Ohio.

PIPE THREADING & CUTTING MACHINES
Actna-Standard Engineering Co., The, Youngstown, Ohio.

Cox & Sons Co., The, Bridgeton, N. J.

Jarecki Mfg. Co., Erie, Pa.

Landis, Mach. Co., Inc., Waynesboro, Pa.

Merrill Mfg. Co., Toledo.

Murchey Machine & Tool Co., Detroit.

Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PLANERS
Cincinnati (Ohio) Planer Co.

PLANERS—Rotary
Espin-Lucas Mch. Wks., Philadelphia.

PLANING MACHINES — Second Hand
(See Clearing House Section)

PLASTICS—Laminated
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTICS — Laminated or Molded
Phenolic

Richardson Co., The, Melrose Park, Ill.

PLASTICS—Molded
Bakelite Corp., 247 Park Ave., N. Y. C.

Consolidated Molded Products Corp.,

Seranton, Pa.

PLASTICS—Synthetic
Bakelite Corp., 247 Park Ave., N. Y. C.

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American Chemical Paint Co., Ambler, Pa.

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Alan Wood Steel Co., Conshohocken, Pa.

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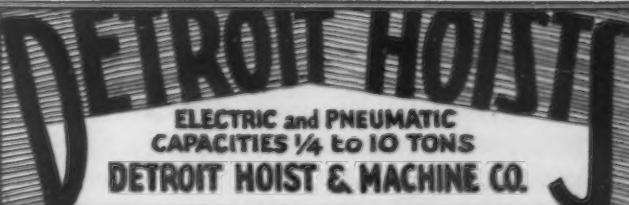
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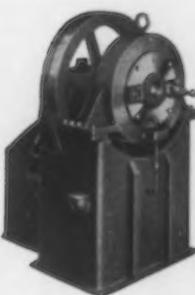
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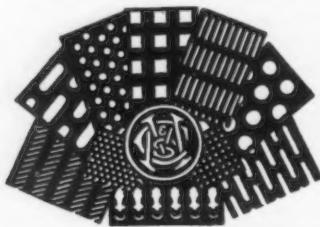
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Carnegie-Illinois Steel Corp. (U. S. Steel Corp., Subsidiary), Pittsburgh & Chicago.

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Republic Steel Corp., Cleveland, Ohio.

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Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.

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Squires & Duane Sts., Cortland, N. Y.
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DUNBAR BROS. CO.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.

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ESTER TOOL & STAMP CO. INC.
Saugus, Mass.

GIBSON, WM. D., CO.
Div. of Associated Spring Corp., Chicago.

GRAMMES, L. F., & SONS, INC.
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Vanadium-Alloys Steel Co., Latrobe, Pa.
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Ludlum Steel Co., Waterville, N. Y.
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Ludlum Steel Co., Waterville, N. Y.
Milne, A. & Co., 745 Washington St., N. Y. C.
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Carnegie-Illinois Steel Corp. (U. S. Steel
Corp. Subsidiary), Pittsburgh & Chicago.

Weirton (W. Va.) Steel Co.

TESTING MACHINES—Ductility

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TESTING MACHINES—Hardness

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

Shore Instrument & Mfg. Co., The,
Jamesburg, N. J., N. Y.

TESTING MACHINES—Impact

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TESTING MACHINES—Materials

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TESTING MACHINES—Spring

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TESTING MACHINES—Tension

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TESTING MACHINES—Universal

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TERMOMETERS

Weston Electrical Instrument Corp., New-
ark, N. J.

TERMOMETERS—Recording

Brown Instrument Co., The, Philadelphia,
Pa.

Leeds & Northrup Co., Philadelphia.

**THREAD CUTTING TOOLS—See Dies,
Taps**

THREAD ROLLING MACHINES

Manville, E. J., Mch. Co., Waterbury, Ct.

Nilson, A. H., Mch. Co., Bridgeport, Ct.

Waterbury (Ct.) Farrel Fdry. & Mch. Co.,
The.

THREADING MACHINES

Eastern Mesh. Screw Corp., New Haven,
Conn.

Geometric Tool Co., The, New Haven,
Conn.

Landis Mch. Co., Inc., Waynesboro, Pa.

THREADING MACHINES—Automatic

Landis Mch. Co., Inc., Waynesboro, Pa.

THREADING MACHINES—Belt

Murchey Machine & Tool Co., Detroit.

THREADING MACHINES—Universal

Olsen, Tinlum Testing Machine Co., Phila-
delphia.

TIES—BALE

Acme Steel Co., Chicago, Ill.

TIN PLATE

Carnegie-Illinois Steel Corp. (U. S. Steel
Corp. Subsidiary), Pittsburgh & Chicago.

Granite City (Ill.) Steel Co.

Inland Steel Co., Chicago.

Joint & Laughlin Steel Corp., Pittsburgh.

Republic Steel Corp., Cleveland, Ohio.

Weirton (W. Va.) Steel Co.

Youngstown (Ohio) Sheet & Tube Co., The.

TIN PLATE MACHINERY

Aetna-Standard Engineering Co., The,
Youngstown, Ohio.

Wean Engineering Co., Inc., The, Warren,
Ohio.

TINNING EQUIPMENT—Sheets

Wean Engineering Co., Inc., The, Warren,
Ohio.

TONGS—Automatic

Heppenstall Co., Pittsburgh.

TOOL BITS

Carboly Co., Inc., 2985 E. Jefferson Ave.,
Detroit.

TOOL HOLDERS

Armstrong Bros. Tool Co., Chicago.

Williams, J. H., & Co., Buffalo, N. Y.

TOOLS—Lathe

Armstrong Bros. Tool Co., Chicago.

Carboly Co., Inc., 2985 E. Jefferson Ave.,
Detroit.

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Products Index

TOOLS—Metal Cutting

Carboly Co., Inc., 2985 E. Jefferson Ave., Detroit.
Chicago-Latrobe Twist Drill Wks., Chicago.
Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.
R & L Tools, Philadelphia.

TOOLS—Precision

Starrett, L. S. Co., Athol, Mass.
TOOLS—Safety, Steel Stamp

Cunningham, M. E. Co., Pittsburgh.

TOOLS—Tungsten Carbide

Carboly Co., Inc., 2985 E. Jefferson Ave., Detroit.

Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

TOOLS—Turning for Automaties

R & L Tools, Philadelphia.

TORCHES—Brazing, Cutting and Welding

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

Weldit Acetylene Co., Detroit.

TOWERS—Water Cooling

Marley Co., The, Kansas City, Mo.

TRACTORS AND TRAILERS—See Trucks, Tractors and Trailers—Industrial

TRAILERS—Industrial—See Trucks, Tractors and Trailers—Industrial

TRAMRAILS—Overhead Systems

Cleveland Tramrail Div. of The Cleveland Crane & Engin. Co., Wickliffe, Ohio.

Harnischfeger Corp., 4101 W. National Ave., Milwaukee.

TRAMWAYS—Wire Rope

Leschen, A., & Sons Rope Co., St. Louis, Mo.

TRANSCRIBING MACHINES

Dictaphone Sales Corp., 420 Lexington Ave., New York City.

TRANSMISSIONS—Hydraulic

American Engineering Co., Philadelphia.

Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

Vickers, Inc., 1120 Oakman Blvd., Detroit.

TRANSMISSIONS—Variable Speed

Reeves Pulley Co., Columbus, Indiana.

TRAPS—Steam

Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

TREADS—Safety

Blaw-Knox Co., Pittsburgh.

Central Iron & Steel Co., Harrisburg, Pa.

Hendrick Mfg. Co., Carbondale, Pa.

Norton Co., Worcester, Mass.

TROLLEYS

Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.

TRUCKS—Dump (Industrial)

Towmotor, Inc., Cleveland.

TRUCKS—Elevating (Power)

Automatic Transportation Co., 75 West 8th St., Chicago, Ill.

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Elwell-Parker Electric Co., The, Cleveland.

Towmotor, Inc., Cleveland.

Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

TRUCKS—Factory, Hand

Lewis-Shepard Co., 122 Walnut St., Water-town Station, Boston.

TRUCKS—Lift (Hand & Foot)

Lewis-Shepard Co., 122 Walnut St., Water-town Station, Boston.

YALE & TOWNE MFG. CO., THE, PHILA. DIV., PHILA., PA.

TRUCKS—Scoop (Industrial)

Towmotor, Inc., Cleveland.

TRUCKS, TRACTORS AND TRAILERS—Industrial

Atlas Car & Mfg. Co., The, Cleveland.

Automatic Transportation Co., 75 West 8th St., Chicago, Ill.

Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.

Elwell-Parker Electric Co., The, Cleveland.

Service Caster & Truck Co., Albion, Mich.

Towmotor, Inc., Cleveland.

Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

VALVES—Acid Resisting

Dietzel Lead Burning Co., Pittsburgh.

Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

National Lead Co., 111 Bowday, N. Y. C.

VALVES—Air Blast for Presses

Littell, F. J. Mch. Co., Chicago.

VALVES—Air & Hydraulic Control

Brown Instrument Co., The, Philadelphia, Pa.

Galland-Henning Mfg. Co., Milwaukee.

Hannifin Mfg. Co., Chicago.

Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

Tomkins-Johnson Co., The, Jackson, Mich.

Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

VALVES—Gas, Water and Steam

Brown Instrument Co., The, Philadelphia, Pa.

Crane Co., Chicago.

Jarecki Mfg. Co., Erie, Pa.

Wood, R. D., & Co., Philadelphia.

VALVES—Hydraulic

Baldwin-Southwark Corp., Southwark Div., Philadelphia.

Bethel (Pa.) Steel Foundry & Machine Co.

Crane Co., Chicago.

Galland-Henning Mfg. Co., Milwaukee.

Vickers, Inc., 1120 Oakman Blvd., Detroit.

Wood, R. D., & Co., Philadelphia.

VALVES—(Pressure Seated) Pneumatic

Cleveland (Ohio) Pneumatic Tool Co., The.

VALVES—Proportioning

Brown Instrument Co., The, Philadelphia, Pa.

VALVES—Pump, Rubber

Garlock Packing Co., The, Palmyra, N. Y.

VANADIUM

Ex-Cell Metallurgical Sales Corp., 30 E.

42nd St., N. Y. C.

VISES

Cincinnati (Ohio) Milling Mch. Co., The.

Jarecki Mfg. Co., Erie, Pa.

Knu-Vise Products Co., Detroit, Mich.

WASHERS—Iron or Steel

Sessions, J. H., & Son, Bristol, Conn.

WASHERS—Leather

Chicago (Ill.) Rawhide Mfg. Co., The.

1366 Elston Ave.

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WASHERS—Lock

American Nut & Bolt Fastener Co., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
Houde Engineering Corp., Buffalo, N. Y.
National Lock Washer Co., The Newark, N. J., and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The Newark, N. J.
Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The Worcester, Mass.

WASHERS—Spring

American Nut & Bolt Fastener Co., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
National Lock Washer Co., The Newark, N. J., and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The Newark, N. J.
Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The Worcester, Mass.

WATER SOFTENERS AND PURIFIERS

Scalfi, Wm. B. & Sons Co., Pgh.

WELDING—Copper Hydrogen Electric

Burnett Tubing Co., Detroit, Mich.

WELDING—Electric

Federal Machine & Welder Co., Warren, Ohio.
Lincoln Electric Co., The, Cleveland.
Westinghouse Elec. & Mfg. Co., East Pgh.

WELDING—Thermit

Metal & Thermit Corp., 120 Broadway, N. Y. C.

WELDING CONTACTORS

Clark Controller Co., The, Cleveland.

WELDING AND CUTTING MACHINES AND EQUIPMENT—Oxy-Acetylene

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

Weldit Acetylene Co., Detroit.

WELDING EQUIPMENT—For Bronze

Automatic Gasflux Co., Cleveland.

WELDING FIXTURES

Harnischfeger Corp., 4401 W. National Ave., Milwaukee.

WELDING MACHINES—Butt

Federal Machine & Welder Co., Warren, Ohio.

Swift Electric Welder Co., Detroit.

WELDING MACHINES—Electric Arc

General Electric Co., Schenectady, N. Y.

Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.

Lincoln Electric Co., The, Cleveland.

Westinghouse Elec. & Mfg. Co., East Pgh.

WELDING MACHINES—Electric Arc. Second-Hand. (See Clearing House Section)

WELDING MACHINES—Flash

Federal Machine & Welder Co., Warren, Ohio.

Swift Electric Welder Co., Detroit.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Press

Federal Machine & Welder Co., Warren, Ohio.

Swift Electric Welder Co., Detroit.

WELDING MACHINES—Seam

Federal Machine & Welder Co., Warren, Ohio.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WELDING MACHINES—Spot

Federal Machine & Welder Co., Warren, Ohio.

Swift Electric Welder Co., Detroit.

Thomson-Gibb Elec. Welding Co., Lynn, Mass.

WHEELS—Rolled Steel

Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

Standard Steel Wks. Co., Burnham, Pa.

WIRE—Aluminum

Aluminum Co. of America, Pittsburgh.

WIRE—Barb

Jones & Laughlin Steel Corp., Pittsburgh.

Pittsburgh (Pa.) Steel Co.

WIRE—Brass, Bronze, Copper, Nickel

Silver or Phosphor Bronze

American Brass Co., The, Waterbury, Conn.

Phosphor Bronze Smelting Co., The, Phila.

Ave., N. Y. C.

WIRE—Electric Heat Resisting

Globar Div., The, Carborundum Co., Niagara Falls, N. Y.

WIRE—Flat, Round, Square or Special Shapes

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Ham-Dee Spring Co., Hartford, Conn.

Pace Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Pretiss, Geo. W. & Co., Holyoke, Mass.

Roehling's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, Ohio.

Wickwire Bros., Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Insulated

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Roehling's, John A., Sons Co., Trenton, N. J.

WIRE—Mattress

Roehling's, John A., Sons Co., Trenton, N. J.

WIRE—Netting

Ludlow-Saylor Wire Co., St. Louis, Mo.

Roehling's, John A., Sons Co., Trenton, N. J.

Wickwire Brothers, Cortland, N. Y.

WIRE—Plane and Music

Webb Wire Works, New Brunswick, N. J.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE—Rustless

Rustless Iron & Steel Corp., Baltimore, Md.

WIRE—Special Drawn Shapes

Rathbone, A. & J., Palmer, Mass.

WIRE—Spring

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Pittsburgh (Pa.) Steel Co.

Roehling's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, Ohio.

WIRE—Spring (Music)

Webb Wire Works, New Brunswick, N. J.

WIRE—Stainless Steel

Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Rustless Iron & Steel Corp., Baltimore, Md.

Webb Wire Works, New Brunswick, N. J.

WIRE—Steel

Bethlehem (Pa.) Steel Co.

Prentiss, Geo. W. & Co., Holyoke, Mass.

Wickwire Brothers, Cortland, N. Y.

WIRE—Welding

Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Lincoln Electric Co., The, Cleveland.

Maurath, Inc., 7400 Union Ave., Cleveland.

Metal & Thermit Corp., 120 Broadway, N. Y. C.

Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Pittsburgh (Pa.) Steel Co.

Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

Roehling's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., The, Fostoria, Ohio.

Wickwire Brothers, Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE DRAWING MACHINERY—See

Wire Mill Mohr, & Equip.

WIRE FORMING MACHINERY

Bald Mch. Co., The, Bridgeport, Conn.

Manville, E. J., Mch. Co., Waterbury, Ct.

Nilson, A. H., Mch. Co., Bridgeport, Ct.

Sleeper & Hartley, Inc., Worcester, Mass.

U. S. Tool Co., Inc., Ampere, N. J.

WIRE MILL MACHINERY AND EQUIPMENT

Morgan Construction Co., Worcester, Mass.

Sleeper & Hartley, Inc., Worcester, Mass.

Torrington (Conn.) Mfg. Co., The.

Waterbury (Ct.) Farrel Fdry. & Mch. Co., The.

WIRE NAIL MACHINERY

Sleeper & Hartley, Inc., Worcester, Mass.

WIRE PRODUCTS

American Spring & Mfg. Corp., Holly, Mich.

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Bethlehem (Pa.) Steel Co.

Buffalo (N. Y.) Wire Wks. Co., Inc.

Eastern Tool & Mfg. Co., Bloomfield, N. J.

Hindley Mfg. Co., Valley Falls, R. I.

Pittsburgh (Pa.) Steel Co.

U. S. Steel Wire Spring Co., Cleveland, O.

Wickwire Bros., Cortland, N. Y.

Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

WIRE ROPE

American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Cleveland.

Bethlehem (Pa.) Steel Co.

Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.

Lechen, A., & Sons Rope Co., St. Louis, Mo.

Roehling's, John A., Sons Co., Trenton, N. J.

Seneca Wire & Mfg. Co., 41 East 42nd St., N. Y. C.

WIRE ROPE FITTINGS

Roehling's, John A., Sons Co., Trenton, N. J.

WIRE STRAIGHTENING AND CUTTING MACHINERY—Automatic

Shuster, F. B. Co., The, New Haven, Ct.

WRENCHES

Armstrong Bros. Tool Co., Chicago.

Williams & Spencer Co., Hartford, Conn.

Williams, J. H., & Co., Buffalo, N. Y.

WRENCHES—Pneumatic

Greenfield (Mass.) Tap & Die Corp.

Ridge Tool Co., Elvira, Ohio.

WRENCHES—Pneumatic

Ingersoll-Rand Co., 11 Broadway, N. Y. C.

ZINC—SLAB (Speitzer)

New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ZINC—Strip

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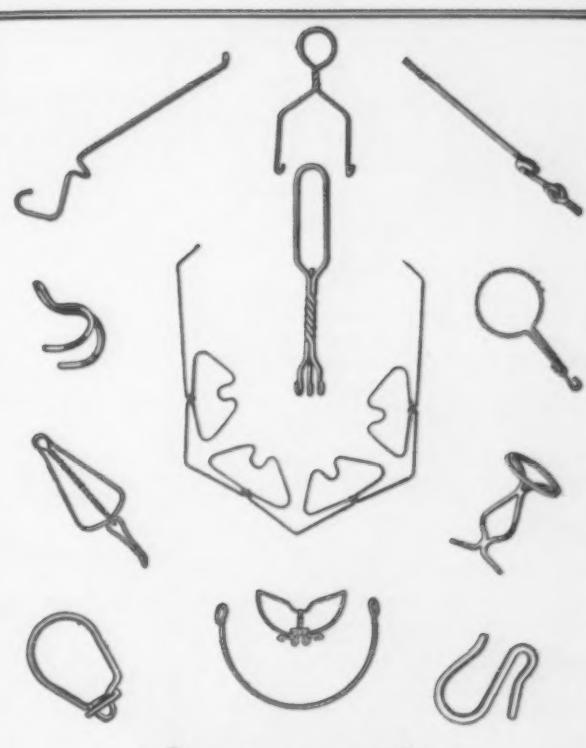
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 No. 6—60" No. 6—72" Brown & Sharpe
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 20" x 68" Landis, plain M.D.
 26" x 96" Landis, plain
 No. 1, No. 2 B. & S. Universal
 No. 2/2 Universal (Bath)
 No. 4—12" x 6" Landis Universal
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 30" x 20" Ryerson Grd. Hd.
 30" x 30" Rahn Larmon, grd. head
 34" x 23" Johnson, triple geared
 60" x 21" Putnam, triple geared
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 No. 2, No. 3, No. 3-S Cincinnati, plain
 No. 2/2 Rockford, plain
 No. 1-B, No. 2-B, No. 3-B Milwaukee, plain
 No. 2-B, No. 3-B Milwaukee ol., Motor-in-Base
 No. 2-B, No. 3-B, 4-B & B. & S., plain
 No. 1-C Cincinnati, plain
 No. 1 1/2" No. 2 B. & S. Universal
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 No. 2, No. 3 Cincinnati, H.P. Vert.
 No. 3-B Milwaukee, Vert.
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 No. 5—48" Cincinnati Hydromatic
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 36" x 36" x 12" Newton Duplex
 38" x 44" x 20" Ingersoll Slab
 Planers, 24" x 24" x 6" American
 30" x 30" x 6", 9", 18" Cincinnati
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 36" x 36" x 8", 12", 18" Cincinnati
 36" x 36" x 12" Gray Maximum Service, M.D.
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 36" x 36" x 14"—24" Cleveland Open Side
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 72" x 72" x 16" Cincinnati
 Turret Lathe, No. 4 W. & S. Univ. Grd. Hd., M.D.
 No. 1-B Foster
 No. 1-A Warner & Swasey
 No. 2-A Warner & Swasey
 No. 3 Cinn.-Acme, A.C. & B.F.
 No. 3-A Warner & Swasey
 No. 4-A Warner & Swasey 7 1/4" H.S.
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EMCO REBUILT TOOLS GEAR CUTTERS

11" Gleason Straight Tooth Bevel Gear Generator, belt
 12" Gleason Automatic Bevel Gear Planer, belt
 Nos. 3, 12 Barber-Coleman Gear Hobbers
 Nos. 3—26" and 3—36" Brown & Sharpe Gear Cutters
 No. 3—26" Cincinnati Gear Cutter, belt
 Cincinnati 16" Spur & Spiral Gear Hobber, m.d.
 No. 5A Lees-Bradner Gear Generator, belt
 No. 6 Fellows Gear Shaper, belt
 No. 7 Fellows H.S. Gear Shaper, m.d.
 No. 16Hs Gould & Eberhardt Gear Hobber, type C, s.p.d.
 No. 18Hs Gould & Eberhardt Gear Hobber, m.d.
 Schuchardt & Schutte Gear Tooth Rounder, belt

ENGINE LATHES—GEARED HEAD

12" x 6" Hendey, m.d., taper
 14" x 5" American, m.d.
 14" x 6" Hendey, m.d., taper
 16" x 6" Hendey, m.d.
 16" x 6" Lodge & Shipley, m.d., taper, 12 speed
 16" x 8" Prentice, m.d.
 16" x 12" Prentice, s.p.d.
 18" x 8" Lodge & Shipley, s.p.d.
 20" x 6" Hendey, m.d.
 20" x 8" American, m.d., taper, 8 speeds
 20" x 8" American, m.d., taper, 12 speeds
 20" x 9" Lehman, m.d., taper, 16 speeds
 20" x 10" American, m.d., taper, 12 speeds
 22" x 13" Lehman, m.d., taper, 16 speeds
 24" x 12" Greaves-Klusman, m.d., taper
 24" x 17" BOYE & EMMES—BRAND NEW, m.d. thru 12 speed head, taper attachment, Timken Bearings, motor driven oil pump, latest type, shipped from factory May, 1937
 27" x 12" Prentice, m.d., taper, 16 speeds
 36" x 28" American, m.d., 16 speeds

PLANERS

22" x 22" x 5' Pease, 1 head
 24" Cincinnati Crank, 1 head, m.d.
 24" Coulter Open Side Crank, m.d.
 24" x 24" x 6" G. A. Gray, 1 head, m.d.
 24" x 24" x 6" Ohio, 1 head
 24" x 24" x 6" Smith & Silk, 1 head, m.d.
 28" x 28" x 10" Cincinnati, 1 head
 30" x 30" x 8" Pond, belt, 1 head
 30" x 30" x 10" American, belt, 1 head
 30" x 30" x 12" G. A. Gray, m.d., 2 heads
 36" x 36" x 12" Fitchburg, m.d., 3 heads
 36" x 36" x 12" Niles, m.d., 4 heads
 36" Widened to 60" x 36" x 12" Gray, 2 heads
 48" x 48" x 14" Niles-Bement-Pond, reversing m.d., 4 heads
 48" x 48" x 15" Niles-Bement-Pond, reversing m.d., 4 heads

BORING MILLS

No. 0 Fosdick Horizontal, 3 1/4" bar
 No. 1 Cleveland Horizontal, 2 1/4" bar
 No. 2 Niles-Bement-Pond Horizontal, m.d., 3% speed, brand new
 No. 4 Niles-Bement-Pond Horizontal, m.d., 5 1/2" speed
 No. 31 Lucas Horizontal, m.d., 3" bar
 30" x 30" x 8" Gisholt, Vertical, 1 head
 36" Bullard Vertical, 2 heads
 36" Colburn Vertical, 2 heads
 37" Niles Vertical, 2 heads, m.d.
 42" King Vertical, 2 heads, m.d., p.r.t., late type
 42" Bullard Rapid Production, 2 heads
 48" Niles-Bement-Pond Car Wheel Borer, belt
 60" Gisholt Vertical, m.d., p.r.t., 2 heads, late
 72" Niles Vertical, 6 step cone
 73" Niles Vertical, m.d., p.r.t., 2 heads, very late type
 62" Niles Heavy Pattern, brand new, m.d., p.r.t., 2 heads

RADIAL DRILLS

3' Carlton H. S. Sensitive, m.d.
 3' Morris Plain, s.p.d.
 3 1/2' Carlton H. S. Sensitive, m.d.
 4' American Triple Geared Plain, m.d., gear box
 4' Hammond Sensitive, belt
 4' Morris Plain, gear box, m.d.
 5' American Triple Geared Plain, gear box
 5' Cincinnati Bickford Universal, m.d.
 6' Fosdick Economax, m.d. thru gear box on arm, 19" column, p.r.t., latest mechanical type
 7' Fosdick, cone

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No. 2 Brown & Sharpe Universal, m.d., taper spindle
 No. 2 Brown & Sharpe Universal, cone
 No. 2 Cincinnati Universal, cone
 No. 2 Rockford Universal, s.p.d.
 Ingersoll Vertical, m.d., 40" rotary table
 No. 2 KYN Milwaukee Vertical, m.d., dial feed, Timken Bearings
 No. 4 Becker Vertical, cone
 No. 22 Garvin Vertical, s.p.d.
 Nos. 2, 3, 4 Cincinnati Plain, s.p.d., flanged spindle
 Nos. 1, 2 Cleveland Plain, s.p.d.
 Nos. 1 1/2, 2, 3, 4 Cincinnati Plain, cone
 No. 4 Kempsmith Plain MaxiMill, m.d., late
 No. 13B Brown & Sharpe Plain, taper spindle
 14" Standard
 48" Oesterlein Tilted Offset, m.d., National Standard Spindle, Timken Bearings, late
 18", 24", 48" Cincinnati Automatics, plain and duplex types, late
 No. 33 Kempsmith Mfg., s.p.d.

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2" Acme Class A Bolt Cutter.
 6" Landis Pipe Machine, cone drive.
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44" Niles, two heads.
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 60" Niles Boring Mill, 2 heads.

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 4" 2 Cincinnati Pl. HI-Power, S.P.D.
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 No. 5B Becker Vertical Miller.

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 36" x 36" x 10" Gray, 2 Hds.

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Punch, 11/16 thru 1 1/2" or 3/4" thru 1 1/2"; Shear

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CLEVELAND 3½"; 2½"; 2½"-2¾" Model "A"

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Lathe, Motor Driven, Heavy
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Spiral Cutting Attachment,
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60" Bullard Vertical Boring
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1-400	Westinghouse	QS	450/675
1-400	General Electric	MPC	160/300
2-300	Westinghouse	SK	150/300
2-200	General Electric	DMC	300/600
1-125	Westinghouse	SK-210	225/900
1-125	General Electric	DMC	150/300
8-120	General Electric	SK	300/900
1-100	Westinghouse	SK	475/1000
5-60	Electric Dynamco	25-S	525/1050
6-40/50	Crocker Wheeler	EM	175/700
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17-25	General Electric	LC	650/1950
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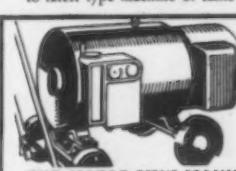
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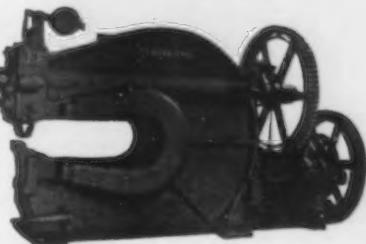
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45" throat, cap. 1¹/₂" thru 1"

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No. 8 WHITNEY DOUBLE END

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CLEVELAND EF DOUBLE END

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No. 2 LONG & ALLSTATTER DOUBLE END

12" throat, cap. 1" thru 1"

No. 5 LONG & ALLSTATTER DOUBLE END

8" throat, cap. 3/4" thru 3/4"

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48" throat, cap. 1" thru 1"

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48" throat, cap. 1" thru 1"

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No. 10L ROCK RIVER SINGLE END

10" throat, cap. 1/2" thru 1/2"

GO ROCK RIVER SINGLE END

8" throat, cap. 3/4" thru 3/4"

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8" throat, cap. 3/4" thru 3/4"

No. 2 LONG & ALLSTATTER SINGLE END

8" throat, cap. 1" thru 1"

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Cap. 8" x 8" x 1"

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No. 4 LONG & ALLSTATTER, cap. 3/16" x 48"

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24" throat, cap. 1" thru 1"

No. 2 HILLES & JONES

12" throat, cap. 1" thru 1"

No. 4 LONG & ALLSTATTER

Cap. 3/4" thru 3/4"

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Cap. 1" thru mild steel plate

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115 V. D.C. MOTORS	90 H.P. G.E. 900 RPM 50 H.P. G.E. 1750 RPM 40 H.P. G.E. 400/600 RPM
230 V. D.C. MOTORS	150 H.P. G.E. 1750 RPM 100 H.P. West. 625 RPM 75 H.P. West. 1140 RPM 75 H.P. West. 800 RPM 75 H.P. D. 400 RPM 80 H.P. West. 1200 RPM 60 H.P. E.D. 500/1200 RPM 50 H.P. G.E. C0181082, 725/1800 RPM 30 H.P. G.E.—CD—1150 RPM 30 H.P. G.E. 825/2000 RPM 15 H.P. G.E. 600/1800 RPM 15 H.P. G.E. 500/2000 RPM 10 H.P. G.E. 400/1600 RPM 10 H.P. G.E. 575/1725 RPM
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HELP WANTED

WANTED: ROLLING MILL MANAGER AND DESIGNER. Important British manufacturing company requires OUTSTANDING ROLLING MILL DESIGNER with wide experience in detail design and layout of rolling mills capable of becoming department manager in England. Answer Box S-630, care *The Iron Age*, 239 W. 39th St., New York.

WANTED—AN ENGINEER with cold drawn seamless tube mill experience who also has a good working knowledge of machine design. Permanent position. Good opportunity for advancement. Write stating education, experience and salary expected to Wm. N. McNunn, Gen. Mgr., Michigan Seamless Tube Co., South Lyon, Michigan.

SITUATIONS WANTED

SALES AND SERVICE EXECUTIVE: Metallurgical Engineer, steel mill trained; five years' experience in sales and servicing of steel and allied products; nine years aggressive managing technical sales and service and directing introduction, marketing, advertising, laboratory and practical research of chrome-nickel alloys and heavy chemicals to steel mills, foundries, fabricated steel, rod and wire, drop forging, automobile and general steel consuming industries. Reply Box S-604, care *The Iron Age*, 239 W. 39th St., New York.

POSITION WANTED BY ROLLING MILL SUPERINTENDENT:—Specialist on high grade plates and sheets, such as Stillbottom, Marine Boiler, Fire box and Hull for Government work. Twenty-five years' experience, good organizer, sober, married. Can guarantee minimum operating costs. References if desired. Address Box S-627, care *The Iron Age*, 239 W. 39th St., New York.

SITUATIONS WANTED

EXECUTIVE—Age 43. Aggressive, resourceful, analytical. University education. Experience sixteen years continuously with largest manufacturer of machinery in its field. Purchasing—sales—production. At present employed as Director of Purchases of that corporation. Satisfactory credentials. Address Box S-586, care *The Iron Age*, 239 W. 39th St., New York.

METALLURGICAL ENGINEER—extensive technical training and industrial experience in foundry, forge, heat treating and welding. Control of materials and plant processes, research and development now employed. Address Box S-626, care *The Iron Age*, 239 W. 39th St., New York.

MR. FACTORY MANAGER—have you an opening in your organization for an experienced pressed metal stamping foreman? Over fifteen years' practical experience, covering estimating, cost and manufacturing. A-1 references, location not important. Address Box S-419, care *The Iron Age*, 239 W. 39th St., New York.

FABRICATING FOREMAN:—Punching, Shearing, spacing, laying out. Organizer. Can handle men and material and get results. Address Box S-633, care *The Iron Age*, 239 W. 39th St., New York.

CAPABLE EXPERIENCED FORGING EXECUTIVE desires connection with aggressive forge plant. Years of experience in manufacture and sales management. Address Box S-555, care *The Iron Age*, 239 W. 39th St., New York.

First class practical BOILER SHOP FOREMAN experienced on boilers, tanks and general plate work and steel fabrication, also capable of laying out my own work. Address Box S-617, care *The Iron Age*, 239 W. 39th St., New York.

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Set solid, minimum 50 words.....	\$5.00
Each additional word 10¢	
All capitals, minimum 50 words.....	\$6.50
Each additional word 15¢	
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Each additional word 15¢	

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Set solid, minimum 25 words.....	\$1.00
Each additional word 4¢	
All capitals, minimum 25 words.....	\$1.75
Each additional word 7¢	
All capitals, leaded, minimum 25 words....	\$2.50
Each additional word 10¢	

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Do not send cash through the mail—Use money order or check.

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duplicates will answer the purpose. Letters forwarded without charge.

*Rates for Help
and Situation
Wanted Ads*

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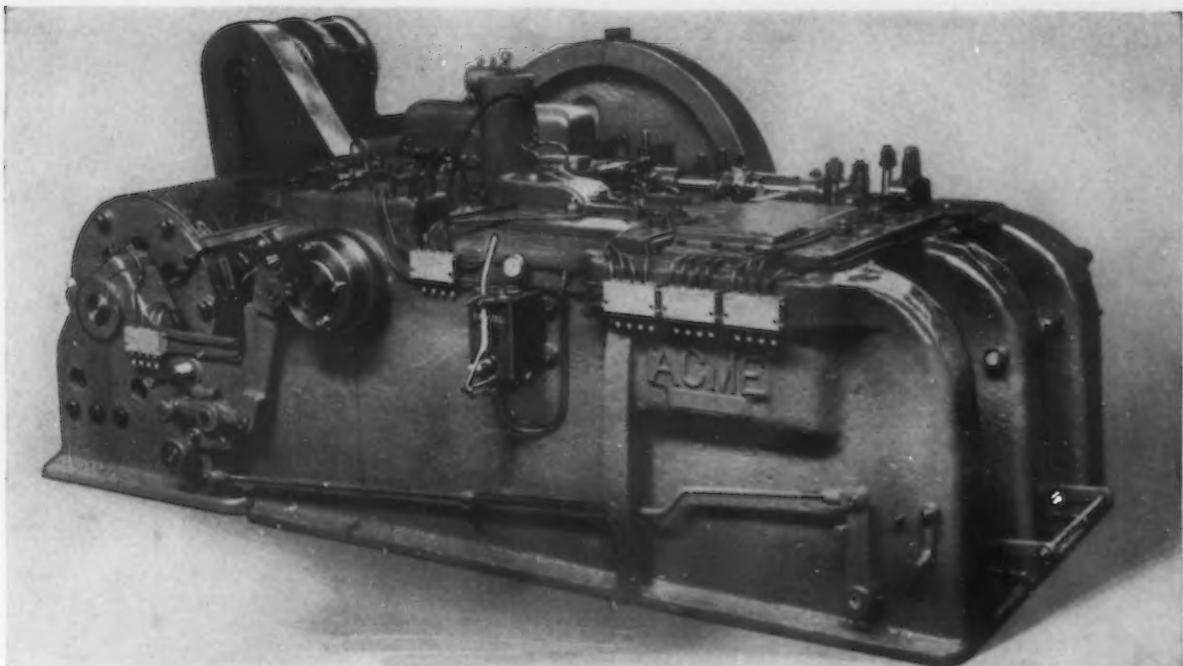
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PROTECT YOUR BEARINGS

with Farval

• Give each bearing proper lubrication, and you reduce repair and maintenance expense, reduce power consumption, eliminate shut-downs and maintain your continuous production schedules.

A Farval Centralized System of Lubrication will fully protect your bearings under all operating conditions.

Farval will provide the positive delivery of lubricant to all bearings on one machine or many. From one central pumping unit the

Farval adjustable measuring valves at the bearings, deliver the lubricant under high pressure in exactly the amount required to provide proper lubrication at all times.

Farval Systems can readily be applied to existing as well as new equipment without interrupting production—and a nearby District Representative will gladly show you how to "Protect Your Bearings—with Farval." The Farval Corporation, 3252 E. 80th Street, Cleveland, Ohio.

Affiliate of The Cleveland Worm & Gear Co., Manufacturers of Automotive and Industrial Worm Gearing

FARVAL
CENTRALIZED SYSTEMS OF LUBRICATION

Special Delivery to Every Bearing

STANDARD OIL COMPANY'S STANORUST

Saves more than its yearly cost on one regrinding job



THE machine shop of a large Wisconsin paper mill was having considerable difficulty with rusting of highly polished press and calendar rolls after grinding. An extra set of ground and polished rolls was kept available for replacement on the machines. These rolls would become corroded after short periods of storage, and required regrinding before they could be used. Various oils and greases were tried to prevent rusting, but with little success. Acid fumes at the mill further complicated this problem. When these fumes were concentrated, rusting developed within a few hours.

After analyzing the problem, a Standard Lubrication Engineer recommended Stanorust No. 5. When applied, Stanorust not only eliminated rusting entirely, but in addition it was found to be much easier to apply and remove than any anti-rust previously used.

The saving on regrinding one roll more than pays for the cost of Stanorust for the entire year at this plant.

Put your rust problems up to a Standard Lubrication Engineer. He may be able to show you how to save both time and money. Call your local Standard Oil (Indiana) office or write 910 South Michigan Ave., Chicago, Illinois.

Copr. 1938, Standard Oil Co.

THE RIGHT
LUBRICANT
PROPERLY
APPLIED
TO REDUCE
COSTS

STANDARD OIL COMPANY (INDIANA)
LUBRICATION ENGINEERING

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.27
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.75
F.o.b. Birmingham	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	\$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
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Gray Forge

Valley or Pittsburgh furnace	\$23.50
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Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.24

Canadian Pig Iron

Per Gross Ton	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

* Spot prices are \$5 per ton higher.
† Spot prices are 10c. per lb. of contained element higher.

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	Per Gross Ton
--	---------------

Domestic, 80% (carload) \$102.50

Speleoleisen

Per Gross Ton Furnace

Domestic 19 to 21% \$33.00

F.o.b. New Orleans \$33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	\$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% \$33.50

For each additional 0.50% silicon up to 17%, 50c. per ton is added.

Manganese 2 to 3% \$1 per ton additional.

For each unit over 3% \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50
-------------------------------------	---------

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional.

Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per lb. Contained Cr. Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c*
2% carbon	16.50c*
1% carbon	17.50c*
0.10% carbon	19.50c*
0.06% carbon	20.00c*

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	\$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally

\$2.00

Ferrotungsten, lots of 500 lbs., nominally

2.05

Ferrotungsten, smaller lots, nominally

2.10

Ferrovanadium, contract, per lb. contained V, delivered

\$2.70 to \$2.90†

Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots

\$2.25†

Ferrocobaltitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton

\$142.50

Ferrocobaltitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton

\$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton

\$58.50

Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville

\$75.00

Fermolybdenum, per lb., f.o.b. furnace

95c.

Calcium molybdate, per lb., f.o.b. furnace

80c.

ORES

Lake Superior Ores

Delivered Lower Lake Ports Per Gross Ton

Old range, Bessemer, 51.50% \$5.25

Old range, non-Bessemer, 51.50% 5.10

Mesabi, Bessemer, 51.50% 5.10

Mesabi, non-Bessemer, 51.50% 4.95

High phosphorus, 51.50% 4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal 17.00c.

Iron, low phos., Swedish, average, 68 1/2% iron, nominally 17 to 18c.

Iron, basic or foundry, Swedish, aver. 65% iron, nominally 15c.

Iron, basic or foundry, Russian, aver. 65% iron, nominal 15c.

Man., Caucasian, washed 52% 45c.

Man., African, Indian, 44-48% 40c.

Man., African, Indian, 49-51% nominal

Man., Brazilian, 46 to 48 1/2% 40c. nominally

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered \$24.00

Tungsten, domestic, scheelite delivered \$22.00 to \$25.00

Chrome ore (lump), per gross ton: South African (low grade) \$16.00

Rhodesian, 45% 22.00

Rhodesian, 48% 25.50

Turkish, 48-49% 25.00 to \$26.00

Turkish, 45-46% 23.50 to 24.00

Turkish, 44% 19.00 to 19.50

Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:

50% \$25.50 to \$26.50

48-49% 25.50 to 26.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail \$18.00 to \$19.00

No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines 20.00

Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. not over 5% silicon, f.o.b. Atlantic ports, duty paid 24.50

Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silicon, f.o.b. Illinois and Kentucky mines 31.50

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt 4.00 to \$4.25

Furnace, f.o.b. Connellsville, Prompt 5.00 to 6.25

Foundry, by-product, Chicago ovens 10.25

Foundry, by-product, del'd New England 12.50

Foundry, by-product, del'd Newark or Jersey City 10.88 to 11.40

Foundry, by-product, Philadelphia 10.95

Foundry, by-product, delivered Cleveland 11.05

Foundry, by-product, delivered Cincinnati 10.50

Foundry, by-product, Birmingham 7.50

Foundry, by-product, del'd St. Louis industrial district 11.00 to 11.50

Foundry, from Birmingham, f.o.b. cars dock, Pacific ports 14.75

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... *Smaller shops join with big automotive plants in buying machinery in Detroit area.*

• • •

... *Orders are lagging behind recent high volume of inquiries, as national policies await clarification.*

• • •

... *Large volume of outstanding live quotations point to active spring.*

• • •

Tool and Parts Plants Follow Automotive Lead

DETROIT—Continued increased machine tool activity is being felt in this market area, with tooling for 1939 models off to a good start. Chrysler, however, is an exception, and so far has failed to get its plans formulated completely enough to keep pace with other leaders. City Pattern Works, Inc., announcing an expansion that will quadruple its space, plans to add equipment in its pattern and machine shop and non-ferrous foundry. Carboloy Co., Inc., centralizing activity from three plants (Cleveland, Stamford, Conn., and Detroit) will erect new buildings on a 40-acre tract north of Detroit. A retooling program has been launched by Mallory Electric Corp., manufacturers of ignition parts and a newly introduced carburetor. This activity is expected to extend through the next month.

Plenty of Quotations Out, But Orders Are Scarce

NEW YORK—both orders and inquiries have fallen off materially in the past week, but prospects for future business are still bright. During the past month, a large number of quotations have been made, many of which will materialize into orders before very long. This is particularly true of equipment inquired for by a number of arsenals in the East, and for the machinery needed for Naval torpedo station at Alexandria, Va. Meanwhile, new orders have been reduced to a mere trickle for small miscellaneous items. General industrial plants, including machinery and electrical manufacturers, are conspicuously absent from the market. Apparently their re-entry into a buying phase of activity will depend upon a pick-up in their operations and a restoration of national confidence.

Santa Fe Issues Third List, But Orders Are Scarce

CHICAGO—For the third time in two months, the Santa Fe has issued a machine tool inquiry. This list asks for bids on nine items, including four engine lathes, two floor grinders, a radial drill and a bench lathe. As yet none of the Santa Fe's previous lists has been closed. Inactivity continues among other railroads except the Milwaukee, an inquiry from which was reported several weeks ago. A slight but steady increase in small tool demand is being noticed, while orders for machine tools still are being received only occasionally. An improvement over February is expected this month, but if this does not materialize, better conditions than usual are being forecast for the summer months.

Demand Spotty, Outlook Fair At Tool Center

CINCINNATI—The machinery market lacked uniformity the past week, as demand turned spotty. An automobile manufacturer bought one crankshaft lathe and other domestic users displayed evident interest in smaller lathes, with one undisclosed order involving in excess of two units. In fact, lathe demand was about equal to an average normal week. Milling and grinder manufacturers indicate fair bookings while drills were without any demand, and heavy tools were relatively inactive. On the whole manufacturers are still optimistic toward late spring improvement, but feel this will be contingent on national policies. The potential ordering is still broad if the present moderately brisk inquiry has any sincere basis. Of course, the trade has a large volume of quotations still outstanding which recent check-backs indicate are still alive and waiting for shop appropriations to become orders.

Management moves cautiously on production. Schedules are shrinking weekly as backlogs diminish. Average operations are now about 25 per cent, with some plants under this. Stock tools are not large since tax provisions on inventory hold anticipatory production down.

Scattered Orders Point to Irregular Improvement

CLEVELAND—The domestic machine tool business shows scattered and irregular improvement. Operations of some stamping shops and smaller manufacturing concerns have increased recently, but very few of the companies are inclined to specify new equipment. The diversification of orders is encouraging to manufacturers.

Partially counterbalancing the better feeling has been the decision of one or two large Ohio industrial concerns within the last two or three weeks to hold back on equipment programs which they had intended to release. Outside of manufacturers working on presses and other equipment for Ford Motor Co., other automotive work actually in Ohio shops at present is light. Export demand continues less active than at the first of the year.

Orders Lag Behind Inquiries At Pittsburgh

PITTSBURGH—Machine tool inquiries are about on a par with a week ago. However, there is a noticeable lag before some of them turn into firm contracts. New orders during the past week were not numerous, and the outlook for improvement in the near future is still somewhat clouded by business conditions. Revision or elimination of the surplus profit tax coupled with at least a clear cut declaration of policy by the Administration, might go a long way towards enlivening the domestic machine tool business. It is almost certain that high labor costs plus heavy taxes will force many customers during this year to increase their purchases of machine tools for replacement purposes in order to continue in a competitive position.

Bridgeport Mill to Be Ready in Summer

BRIDGEPORT BRASS CO., Bridgeport, Conn., expects its new \$4,000,000 non-ferrous rolling mill to be operating by mid-summer. It will produce all of the copper base alloys in sheet form.

Smooth, continuous flow of metals through all stages from ingots to finished material, automatic devices for handling to insure utmost speed and economy, similar to the straightline principle of production in steel and other industries, are features of the mill, according to Bridgeport Brass officials.

PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Continental Can Co., Inc., 100 East Forty-second Street, New York, has let general contract to Austin Co., Cleveland, for one-story addition to branch plant at New Orleans, partly for storage and distribution. Cost over \$75,000 with equipment. Favrot & Reed, Nola Building, New Orleans, are architects.

United States Engineer Office, New York District, Army Building, New York, asks bids until March 29 for six cast steel ball joints and six cast steel retaining rings for dredges Atlanta, Raritan and Navesink (Circular 163).

Carbide & Carbon Chemicals Corp., 30 East Forty-second Street, New York, has acquired close to 200 acres at Texas City, Tex., for new branch plant, to include power house, pumping station, machine shop and other mechanical departments. Work is scheduled to begin soon. Cost about \$3,500,000 with equipment. Other units will be built later.

United States Rubber Products, Inc., Broadway and Fifty-eighth Street, New York, has let general contract to Batson-Cook Co., West Point, Ga., for one-story addition to mill at Hogansville, Ga., in part for storage and distribution. Cost close to \$50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 1 for about 180,000 lb. of forged steel liners (Schedule 3115); until April 5, upper and lower roller tracks and parts (Schedule 3122) for Brooklyn and Philadelphia Navy yards; 5000 gasket-type thermocouples (Schedule 3099) for Philadelphia yard; until April 1, 62 power-driven fuel pumps (Schedule 3073) for Philadelphia and Paterson, N. J.

Safe Fuel Corporation, Long Island City, New York, has leased building at 42-29 Tenth Street, for new plant for processing fuel oils.

Cities Service Oil Co., 70 Pine Street, New York, has approved plans for expansion and improvements in oil refineries at Petty's Island, Philadelphia; East Braintree, Mass.; and East Chicago, Ind. At first noted plant new equipment will be installed for gasoline production, as well as for other petroleum products, to increase capacity about 50 per cent; at East Braintree refinery work will include installation of a new stabilization and propane gas recovery plant and other equipment; a new stabilization and polymerization plant will be installed at East Chicago refinery to increase present output about 10 per cent. Entire project will cost about \$1,500,000.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until April 1 for 7000 ft. of cable and seven reels (Circular 153); until April 12 for dial frame assemblies, coil assemblies, transformer assemblies, thermostats, mountings, plugs, transformers and other equipment (Circular 166).

Korrol Mfg. Co., 232 Greenwich Street, New York, manufacturer of metal products and operating a general machine works, has leased four floors in building at 350-54 Greenwich Street, for expansion and will remove to new location and increase capacity.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until March 28 for 160,000 aluminum blocks (Circular 734); until April 7 for 220,000 metal parts for fuses (Circular 756).

E. I. duPont de Nemours & Co., Inc., duPont Building, Wilmington, Del., has authorized a fund of \$33,200,000 for expansion and improvements in chemical and other plants in different parts of country, including new production units and equipment. Over \$7,000,000 of this fund will be used by Cellophane division for new plant near Clinton,

Iowa, on which work is scheduled to begin soon.

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until March 29 for aluminum and aluminum alloy washers (Req. 996 Aero), one engine overhaul universal stand and three mounting plates (Req. 10½ Aero).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 28 for three high-speed milling attachments (Circular 804); until March 29 for 200,000 lb. of lead antimony alloy and reworking 100,000 lb. of bullets, etc., into 100,000 lb. of lead antimony alloy (Circular 787); until March 30, two motor-driven floor-type notching machines (Circular 803), 95 items of wheels, with 36 wheels in each item, manufactured with special aluminous oxide grit (Circular 796).

◀ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 29 for 173 engine-driven fuel pumps (Schedule 3097) for East Hartford, Conn., and Philadelphia; until April 1, nickel-copper alloy tubing (Schedule 3092), 850 steel blank shells (Schedule 3055); until April 5, 300 steel shells and 800 phosphor bronze shells (Schedule 3109) for Newport, R. I., Naval Air Station; thrust bearings for turbines (Schedule 3119), chain hoists (Schedule 3096) for Boston, Charleston and Puget Sound Navy yards.

Watson Centrifugal Cotton Gin Co., Bridgeport, Conn., recently organized with capital of \$50,000 by Frank Watson, Jonesboro, Ark., to manufacture a new type of cotton gin, using centrifugal force instead of customary saw teeth for cotton separation, will occupy part of plant of Jenkins Brothers, Main Street, Bridgeport, manufacturer of valves, etc., for initial production, including parts manufacture and assembling.

Pneumatic Drop Hammer Co., 123 Heath Street, Roxbury, Boston, has let general contract to Clark & Smith, Inc., 1372 Hancock Street, Quincy, Mass., for one and two-story and basement addition, 50 x 140 ft. Cost close to \$50,000 with equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 29 for two 3-ton each ball-bearing chain hoists, spur-gearred, with 22-ft. chain (Circular 177).

M-B Mfg. Co., recently organized by members of Mettler Machine Co., 132 Lawrence Street, New Haven, Conn., manufacturer of special machinery, has purchased a building at 1060 State Street, for manufacture of metal products.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until March 29 for one steam pump (Circular 398-106); until April 4 for rail shop and locomotive equipment, air brake equipment parts, engine parts, motor parts, pump parts, etc. (Circular 398-115).

Interocean Dirigible Corp., Richmond, Va., Garrett W. Peck, vice-president, is arranging for a stock issue of 1,250,000 shares, valued at \$16,250,000, to be used in part for erection of plant at or near Richmond for production of all-metal dirigibles and new design, with engine units and propellers in tandem in long tube running from end to end of ship. Other parts of fund will be used for development of new aircraft and general operations.

General Purchasing Officer, Panama Canal, Washington, asks bids until April 4 for 205,000 ft. of rubber insulated wire, 5000 ft. of rubber insulated cable, telephone cable, copper flexible cord, asbestos-insulated stove wire, copper magnet wire, 60 steel surface mounting cabinets, panelboard, chain for chain fenders and other equipment (Schedule 3341); until April 6, 10,000 lin. ft. of galvanized steel wire poultry netting, copper wire cloth, one 2500-lb. platform scale, two boiler feed pumps, turn-buckles, brass bell chain, gas regulators, pressure and vacuum gauges, and other equipment (Schedule 3342).

Commanding Officer, Ordnance Department, Aberdeen Proving Ground, Aberdeen, Md., asks bids until March 30 for parts for stokers, including plates, filler plates, tuyeres, rods, etc. (Circular 78).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 29 for four electric-driven winches and spare parts (Schedule 3064) for Norfolk, Va., Navy Yard; until April 1, parts for airplanes (Schedule 900-1589) for Norfolk and Sewall's Point yards; mufflers, evaporators, distillers and spare parts (Schedule 3094) for Portsmouth Navy Yard; one revolving electric-operated truck crane, with lead battery (Schedule 3049); until April 5, motor-driven portable air compressor (Schedule 3103) for Eastern or Western Navy yard.

◀ BUFFALO DISTRICT ▶

Jamestown Metal Equipment Co., Allen Street, Jamestown, N. Y., manufacturer of automobile radiators, etc., has let general contract to Warren Construction Co., 335 Steele Street, for two-story addition, 40 x 60 ft., to occupy portion of site, 240 x 250 ft., near plant, recently acquired. Cost close to \$50,000 with equipment. Additional units will be built later.

National Aniline & Chemical Co., 351 Abbott Road, Buffalo, plans expansion and improvements, including new buildings to replace existing old structures and installation of equipment. Cost close to \$150,000 with machinery.

Curtiss Aeroplane Division, Curtiss-Wright Corp., Vulcan Street and Kenmore Avenue, Buffalo, has let general contract to Darin & Armstrong Co., 2041 Fenkel Street, Detroit, for two one-story additions. Cost close to \$100,000 with equipment.

◀ SOUTH ATLANTIC ▶

Crystal Springs Water Co., 92 N.E. Twenty-eighth Street, Miami, Fla., C. F. Kittel, head, has asked bids on general contract for one and one-half story mechanical-bottling, storage and distributing plant on N.E. Ninth Court, 30 x 75 ft. Cost about \$45,000 with equipment.

Quartermaster, Fort Screven, Ga., asks bids until March 28 for steel boiler tubes (Circular 826-25).

Tallahassee Coca-Cola Bottling Co., Tallahassee, Fla., has asked bids on general contract for two-story mechanical-bottling plant, 72 x 90 ft. Cost close to \$50,000 with equipment. Francis P. Smith, Norris Building, is architect.

◀ SOUTH CENTRAL ▶

Ashland Oil & Refining Co., Ashland, Ky., is arranging fund of about \$750,000 for expansion and improvements in oil refineries, storage and distributing facilities, including steel tanks, pumping equipment, etc. Company has approved plans for a skimming unit addition to Leach Oil refinery. Plans also are under way for new bulk terminals at Maysville and Covington, Ky.

United States Engineer Office, Memphis, Tenn., asks bids until March 29 for six finished cast steel ball joint retaining rings (Circular 226).

Masonite Corp., Laurel, Miss., manufacturer of insulating board, wall board and other special pressed wood pulp products, plans ad-